

Powerful PBXs • Distributing data entry  
John Naisbitt looks ahead • Framework: A user perspective

# COMPUTER DECISIONS

AUGUST 27, 1985

THE MANAGEMENT MAGAZINE OF COMPUTING

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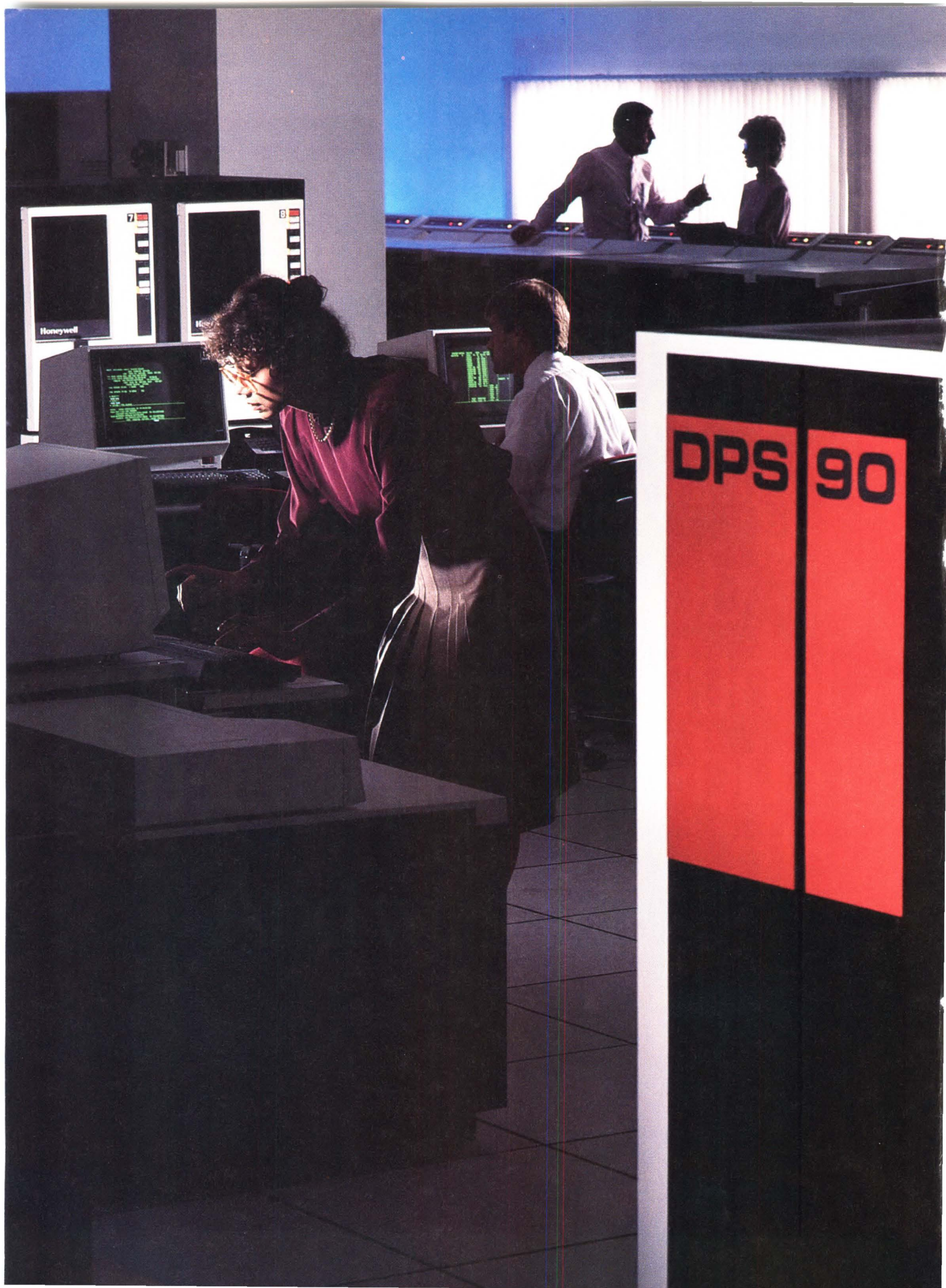
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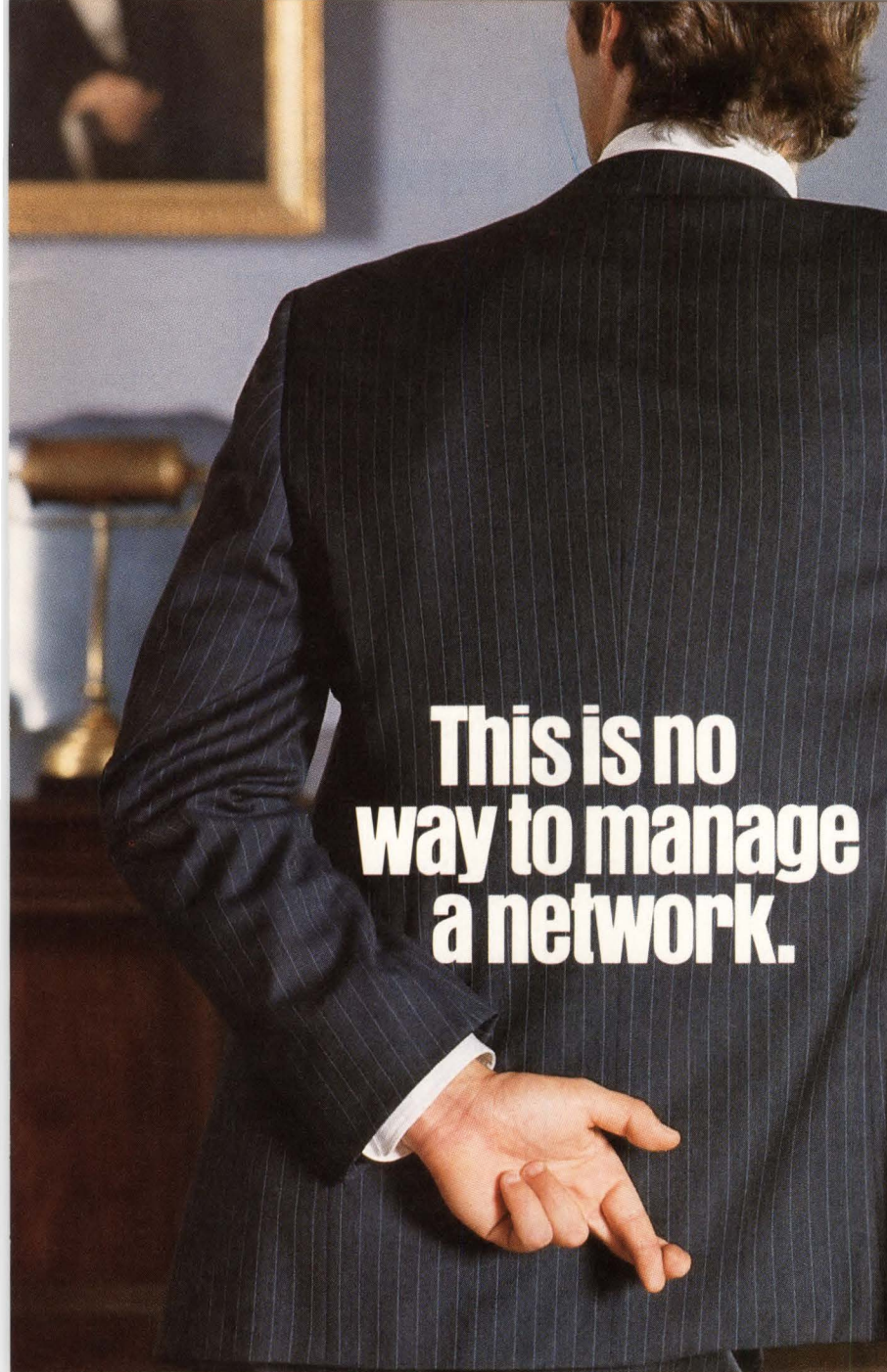
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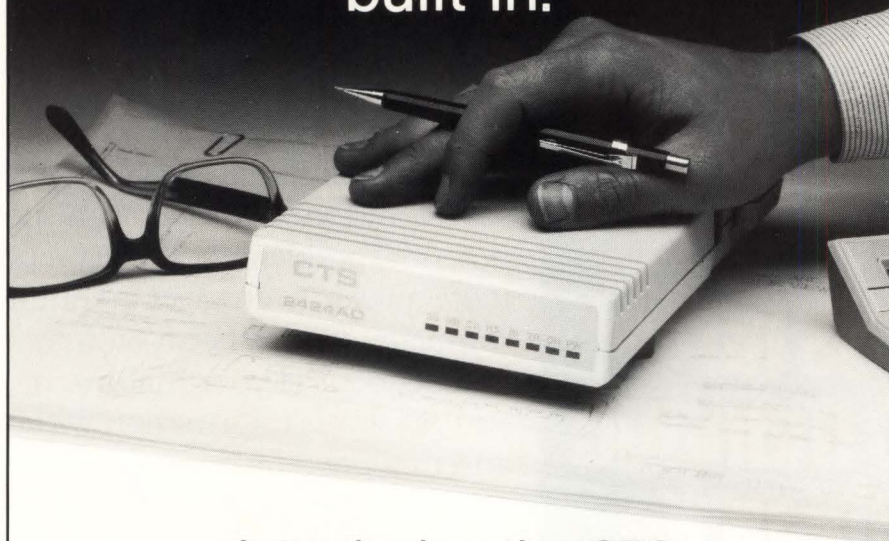


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## LETTERS

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Your well-written news item, "Expert Systems in the Economy Size," May 21, regarding microcomputer-based expert systems, found little disagreement among our professional staff. We agree that these systems are not necessarily "toys." It is our experience that microcomputer-based expert systems make an excellent training tool. However, one aspect of these systems was not discussed in the article. We have found that these systems can provide a very good delivery vehicle for the distribution of expert systems throughout an organization, including geographically remote sites where expert assistance is needed.

SRI International's expert system, Series-PC, was not mentioned in your article. Series-PC has been on the market since early 1984. It is written in Lisp and runs on an IBM PC or PC XT. Series-PC includes backward and forward chaining, a rule editor, and window displays. Series-PC is priced at \$15,000, including a training seminar.

Louis Fried  
Director

Center for Information Technology  
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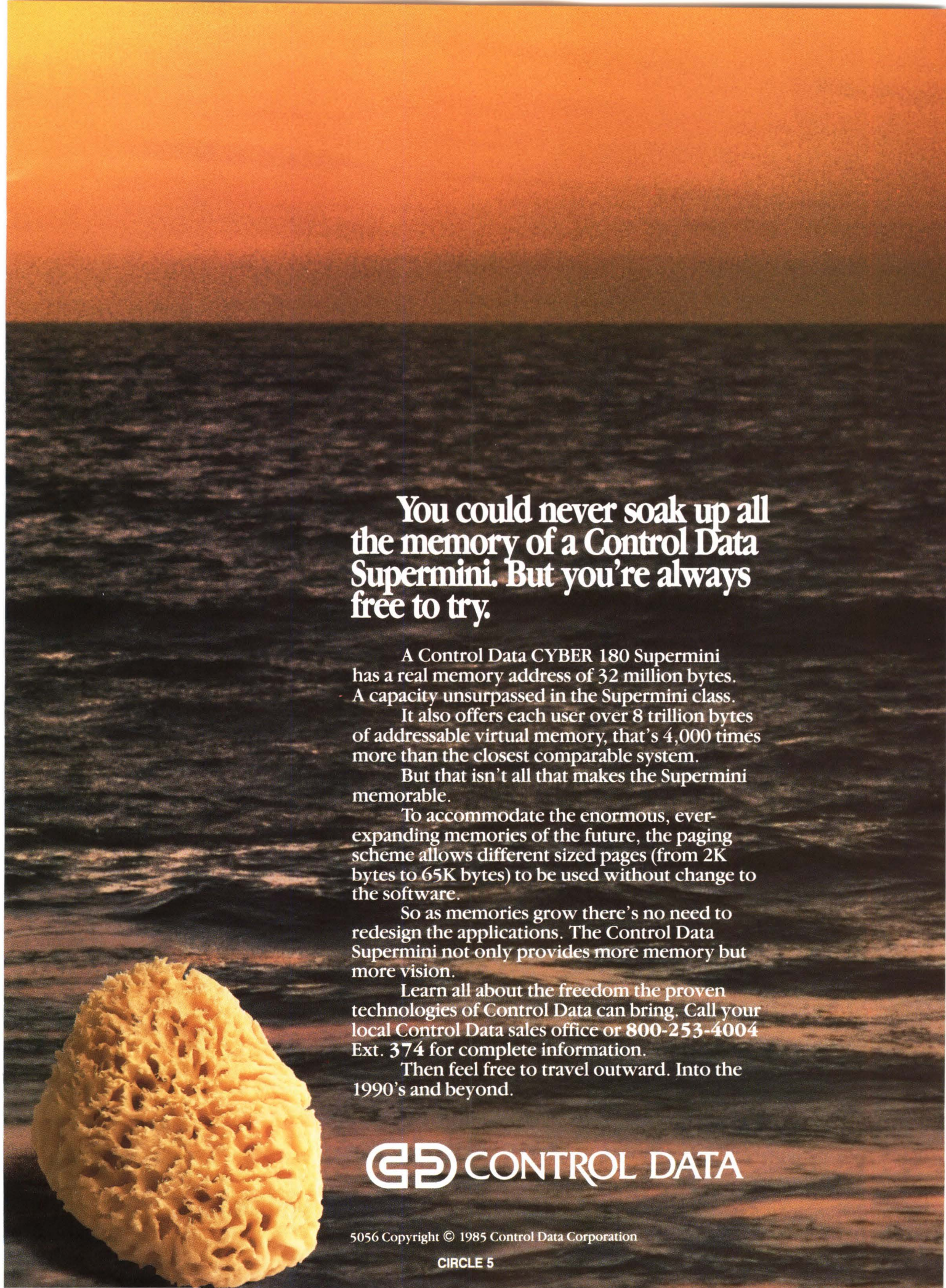
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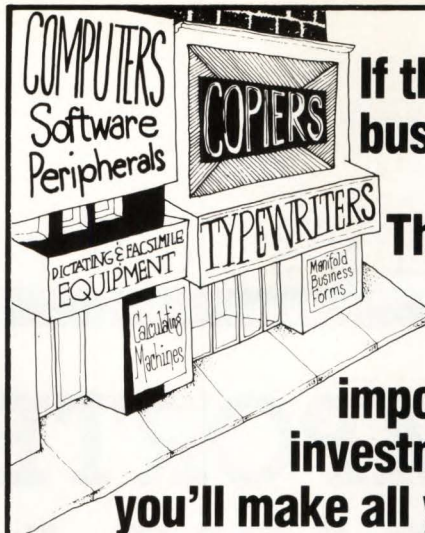
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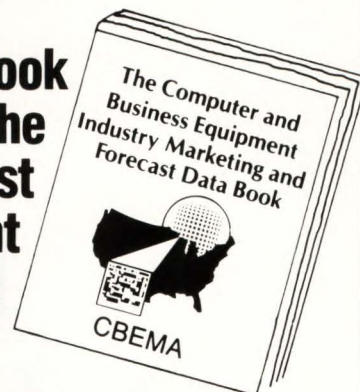
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## I N S I G H T

by Mel Mandell

# IMPORTED LEMON-AID

I've just bought my first Japanese-made car. I'm not happy about the decision; I'm sure I'll be pleased with the machine. All else being equal, or even close to parity, I would have much preferred to plunk down all that cash for an American-made car. But I've been burned: My current U.S.-made car has been the most unreliable vehicle I've ever owned. For the considerable thousands I've spent on repairs, I could have been driving a luxury car instead of that mid-priced, four-door lemon.

Unfortunately, the decline in reliability of American products isn't limited to cars. Sources in the computer industry tell me Japanese-made integrated circuits are much more reliable. And the often-cheaper Japanese chips are displacing the American-made chips in great numbers. Of course, there's nothing new in this trend. We all use Japanese cameras and entertainment electronics because they're made better at a lower price than the American equivalents.

What can be done to raise the reliability of American goods so that they can once more compete in world markets? It would be too easy on my part to thun-

der about the poor work ethic among Americans in both the manufacturing and service sectors of the economy. It wouldn't hurt if management and union officials stopped whining about overly powerful foreign competition. Instead of calling for protectionist measures, they should be constantly pushing the workers they lead to show true concern about quality.

Much of the remedy lies in a radical upgrading of our educational system.

We have to do more than copy Japanese management methods; we have to match the discipline of their school system as well. Instead of automatically promoting children exposed to a minimum of schoolwork, their teachers should be pushing them as the teachers in Japan do. Children in Japan know they have to conform to high standards or they won't share in life's benefits.

Bemoaning the sad level of schooling in the United States is hardly new. Ad-

miral Hyman Rickover preached this message 25 years ago when he encountered much difficulty in finding manufacturers that could meet his criteria for the U.S. Navy's nuclear subs. Recently, President Reagan has tried to bolster the position of American teachers, in part by offering to include a teacher on a future space-shuttle flight.

The down-to-earth problem is that taxpayers don't want to fund the higher taxes that would enable local school systems to attract better teachers. In view of the unlikelihood of a new attack on the reliability problem at its origins, I suspect that I will be driving foreign-made cars for years to come, accompanied by my guilty conscience. □

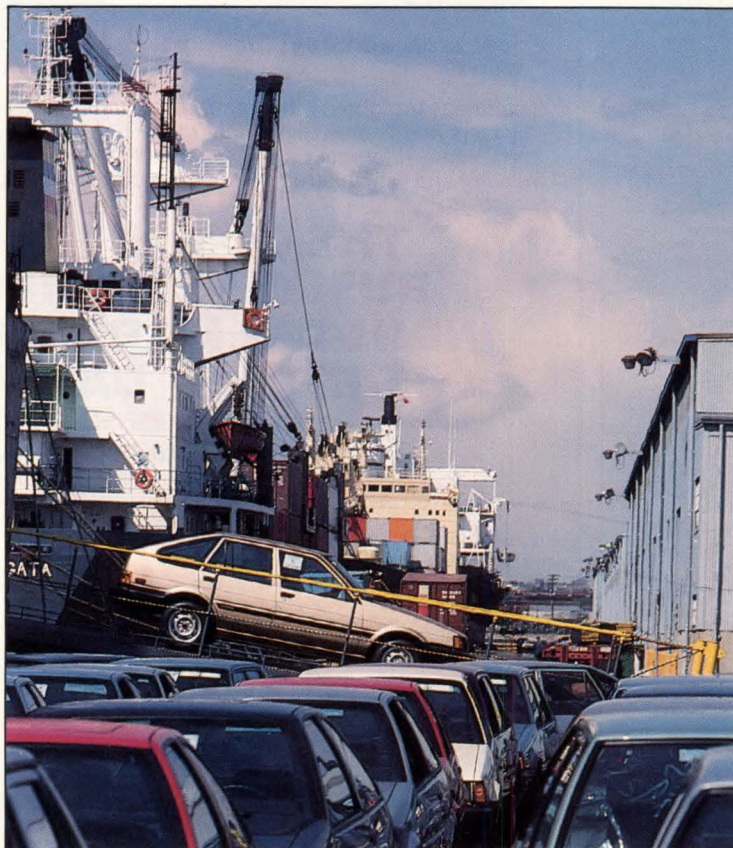


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A close-up photograph of a license plate mounted on a dark red car. The license plate is white with the text 'NOMAD 2' in large, raised, dark red letters. The plate is secured with two screws at the top. Above the plate is a circular headlight or fog light. The car's body is a deep red color, and the background is dark and out of focus.

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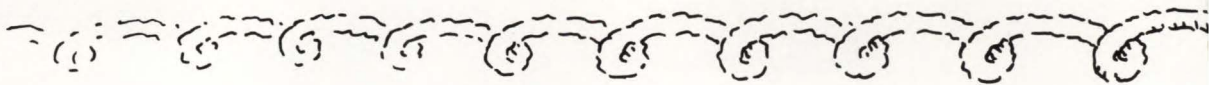
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Edited by Joseph Braue, News Editor

## NAISBITT'S MEGATIPS



John Naisbitt and Patricia Aburdene say managers must prepare for a labor shortage in the 1990s.

**M**egatrends author John Naisbitt and his wife Patricia Aburdene have a vision of the office of the 1990s: "People are talking about their work, exchanging ideas; top managers and newcomers know one another and often work together; people are learning at company-sponsored events like lectures and concerts, and through travel for specialized training or stimulation. People are working on what interests them most. . . ."

Managers will have to create this workplace both to attract competent employees from a shrinking labor pool

and to best utilize the talents of the so-called baby boom generation, say Naisbitt and Aburdene. This is the message of *Re-inventing the Corporation* (Warner Books, \$17.50), the authors' sequel to *Megatrends*. *Megatrends* summarized events and developments you probably had already read about, but it offered no advice to managers and executives on how to respond. *Re-inventing the Corporation* offers this advice.

Perhaps the most important change facing managers in the '90s will be a shortage of qualified workers, the authors say. As the baby boomers grow grayer in the beginning of the '90s, the

labor force will increase only .8 percent annually, as contrasted to the 2.5 percent yearly increase during the '70s. In addition, technology will continue to create many more jobs than it eliminates, Naisbitt says. Corporations are going to have to compete aggressively for qualified workers by offering vastly better working conditions, not just higher salaries, the authors say. The authors cite a 1983 study in which respondents said high pay and benefits were not among the top 10 qualities they wanted in a job. The desire to "work with people who treat me with respect," and the need for "interesting work" ranked first and second.

In an interview, Naisbitt explained that the labor crunch will especially hit computer-related professions, which have been facing a shortage of qualified personnel for several years. "In the coming sellers' market, the competition for qualified employees will be even fiercer, with the very best people not going to companies with the old hierarchical management structure, but to organizations that allow workers, such as programmers, to experience literal and psychic ownership in the company," Naisbitt said.

Managers must nourish and cultivate workers' personal growth, which is more important than money to baby boomers and to post-baby boomers as well, according to the authors. "We have to think increasingly about the manager as teacher, as mentor, as developer of human potential," they write.

*Re-inventing the Corporation* suggests several ways for managers to achieve the new workplace of the '90s. The authors suggest that most of the reinventing will be done by entrepreneurs running small companies; managers in large corporations can learn from small operations, they say.



## NEWS & COMMENT

Senior managers should get out of their offices and out into the field with young talent. Employees should be moved laterally within the corporation to develop well-rounded experience profiles. Instead of the assembly-line approach of assigning workers to one small task of a larger job, managers should structure jobs to have workers attend alternately to all the tasks of a job so they get the big picture.

*Re-inventing the Corporation* calls for managers to scrap authoritarian, multilevel management structures to allow corporations to be run as small businesses. Among their suggestions for "smashing" the corporate bureaucracy: all employees should be called by their first names, a system of reverse reviews should be set up for employees to evaluate their bosses, authority should be decentralized, workers should set and monitor their own goals, and—Naisbitt's favorite—management should adopt a policy to do business only with pleasant people.

MIS/dp is already involved in decentralizing management, Naisbitt says, because computers have given top managers access to computer information previously analyzed and delivered by middle management. Further, computers allow for more individualized relations with employees. "With computers, you can have separate contracts for 40,000 employees; without them, everybody is treated the same," Naisbitt says.

Corporations will become more concerned with educating students, and MIS/dp will be at the forefront of that trend. Corporations can contribute most to computer-science courses, and Naisbitt sees MIS/dp personnel being loaned to the schools to train students. Corporations will be spurred by the fact

*(Continued on page 18)*



Photo by Howard Goldstein

Wilton Jones, Multimate's CEO, says Multimate needs a mainframe word processing package.

## WORD PROCESSING: FROM MICROS TO MAINFRAMES

**R**eversing the trend of making micro-computer versions of mainframe software, IBM and Multimate International Corp. (East Hartford, CT) have announced plans to make mainframe versions of their micro word processing packages. The question is, who needs them?

David Terrie, an analyst at the Yankee Group, Boston, believes most corporate users prefer to write and edit on micros. Word processing packages on large systems have unacceptable response times and are an inefficient use of system resources, he says.

Most word processing software available to IBM terminal users is in the

form of text editors, such as Script, Xedit, and the Advanced Text Management System. They are generally inflexible, hard to learn, and have few of the functions (such as automatic justification) that micro word processing users take for granted.

Despite their drawbacks, centralized word processing systems are attractive to MIS/dp managers seeking to maintain control of computing resources. Cato Carpenter, an analyst with Alex Brown & Sons Inc., a Baltimore-based stock brokerage, sees centralized software as a way for MIS/dp to regain control lost to independent micro users

*(Continued on page 18)*



# NEWS & COMMENT

## MEGATIPS

(Continued from page 17)

that they stand to lose millions of dollars because of mistakes by poorly educated workers.

Corporations will also need more flexible policies to outbid their competition for qualified women, many of whom will be considering motherhood after devoting years to their careers. Between 30 percent and 40 percent of systems analysts and programmers are women, Aburdene says. Day care, alternative working hours that allow

working women to care for their children, and better pay will have to be offered to women. "We all know that what we pay women is not fair," Naisbitt and Aburdene write.

On what experience do Naisbitt and Aburdene rely to give you this advice? Both have worked for major corporations—IBM and Eastman Kodak. Aburdene is a business writer, and Naisbitt's various jobs included a stint at the U.S. Department of Health, Education, and Welfare from 1963 to 1966. Before *Megatrends* was pub-

lished, Naisbitt filed for bankruptcy, was convicted of bankruptcy fraud, and was ordered to serve 200 hours of community service. Naisbitt says the fraud charge wouldn't have stuck but he pleaded guilty on his lawyer's advice.

Aburdene suggests that the new book is for the CEO and every manager. "It's also for departmental managers because the only way that change will come is if they reinvent their departments." *Re-inventing the Corporation* is due out next month. □

## WORD PROCESSING

(Continued from page 17)

in the corporation.

A solid centralized word processing system can also help MIS/dp standardize on one word processing interface for micro and mainframe users, making it easier for employees to do word processing on both micros and terminals.

Alan Cameron, chief executive officer of The Mega Group, an Irvine, CA-based software vendor, says easier, more flexible mainframe packages are needed to address large writing projects, such as ones handled by several departments. Cameron says mainframe software provides needed central control over contributions and revisions made to large projects. The Mega Group offers a mainframe word processing module similar to IBM's Displaywrite to go with its other mainframe offerings.

Last October, IBM announced its intention to make Displaywrite available on mainframes, but no date for the implementation was mentioned. After the announcement, between 25 and 30 major corporations contacted Multimate demanding a similar product, says CEO Wilton Jones. Multimate moved quickly to develop a mainframe version of its word processing software. "We didn't want to go out of business," says Jones.

Multimate's mainframe package will be available early next year, and will run first under IBM's VM mainframe

operating system, and later under MVS. Early versions of Multimate's mainframe word processor won't have all the advanced features of the micro edition, such as mail merge and footnoting, Jones says. Such features will be added by the end of next year, he says.

Multimate is budgeting \$2 million for the mainframe project; a 45-member programming team will develop the software at a research facility in Ireland. Jones says the project will not be affected by Ashton-Tate's (Culver City, CA) impending acquisition of Multimate. An acquisition by Ashton-Tate buys time for Multimate, says David Terrie. "Multimate will now have more money in the coffers for the project and will be able to withstand a direct competitive assault by IBM," he says. But Ron Posner, Ashton-Tate's executive vice president, wouldn't comment on Multimate's mainframe strategy, although he said Ashton-Tate respects Multimate's entrepreneurial spirit.

Several analysts say Multimate may find an advantage in IBM's historic weakness in word processing. "The

large majority of IBM accounts use something other than IBM for word processing," says Jack Hart of International Data Corp., the Framingham, MA-based market researchers. Terrie says the Displaywrite version that runs on IBM's System/36 minicomputer is slow, inefficient, and not a true re-compilation of the micro Displaywrite package.

But there are also dangers for Multimate. Robert Fertig, president of Enterprise Information Systems Inc., a Stamford, CT-based IBM watcher, believes Multimate is getting in over its head. "When you enter the mainframe world, you face many difficult challenges," he says. "You have to support different models of 3270 terminals, IBM Personal Computers, and other kinds of workstations. There's backup and recovery, security, merging with other applications, and decisions about which functions to keep at the intelligent terminal and which ones to put on the mainframe. Let too many users access the system, and the response time becomes intolerable. There's a lot of complexity, and I'm not sure Multimate is up to it."

Terrie sees less risk in Multimate's move. "The key is that Multimate will be able to work throughout the IBM architecture," he says. If Multimate can work on a mainframe as well as a micro, it will gain legitimacy as a standard."

—Anita Micossi

(News continued on page 23)

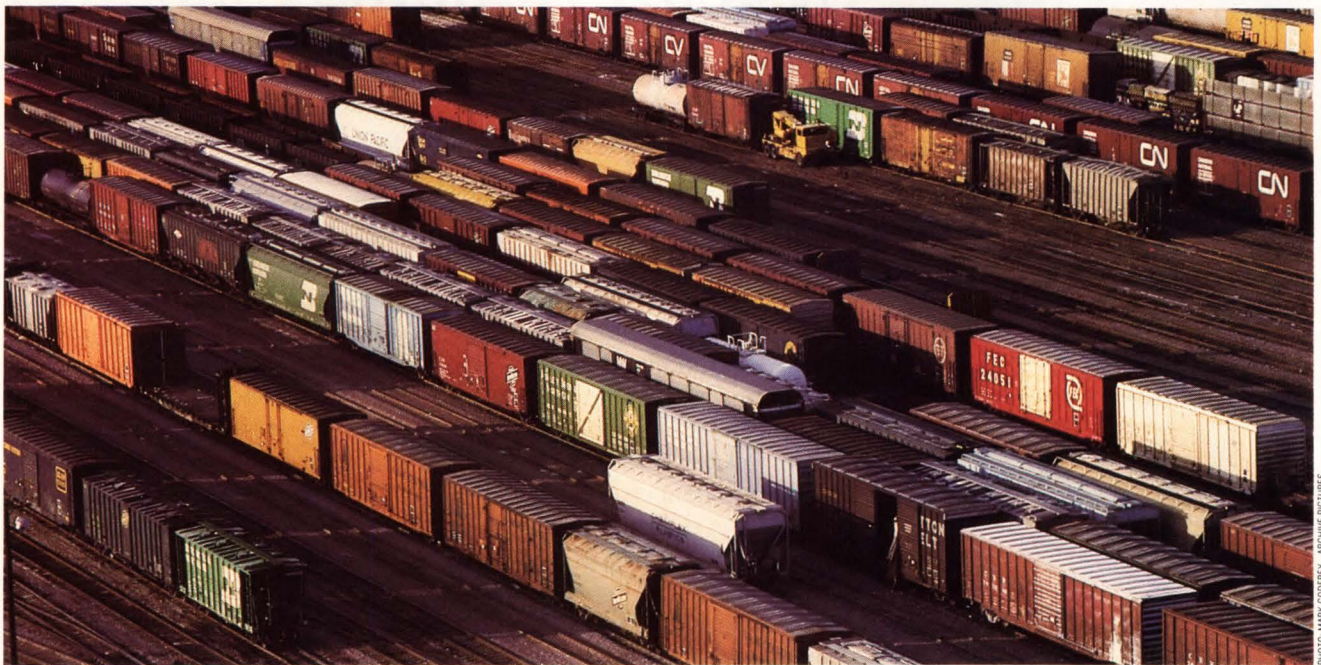
**"We didn't want  
to go out of  
business."**

*Jones, Multimate*



# IBM® Software Notes

News for the DP professional



*Rail car leasing is just one of the many financial services supported by GE Credit Corp.'s national data network. IBM's Information/Management software helps GECC's data processing staff identify and correct network problems fast.*

PHOTO MARK GOURLEY - ARCHIVE PICTURES

## Information/Management Helps GE Credit Keep Network On Track

"We have happier customers."

So says Tom Dixon, manager of computing and telecommunication services for General Electric Credit Corporation (GECC) in Stamford, Connecticut. He is describing the use at GECC of IBM's Information/Management, Version 2—a licensed program that helps manage large data networks.

With assets of \$17 billion, GECC is one of the country's largest commercial lenders—active in retail credit, commercial leasing and mortgage banking.

And GECC operates a very large network: one with more than 2,000 terminals. The users, Mr. Dixon's customers, are in GECC field offices, retail stores and GECC client offices. They operate workstations, point-of-sale terminals and credit authorization terminals.

IBM's Information/Management program helps Mr. Dixon's

staff use its computer to provide better service to customers. It enables the staff to record and retrieve all the data relevant to any network operating problems: the list of equipment at each site, the details of every communication link, a complete record of every problem occurrence at each site, complete data on every type of equipment used in the network, and a detailed file on each vendor.

These data files can quickly be searched to learn, for example, the history of a particular incident or of all previous occurrences of similar problems.

"We know our customer's environment," Mr. Dixon says. "Over the telephone from GECC's customer support center, we can pro-

vide procedures to identify or correct the problem. We can see every change that's been made to the telephone circuit serving that site. We can see all problems on that circuit, year to date. And we can talk to the telephone vendor in specific, geographic terms.

"We're automating ourselves so that our present staff can handle a much larger network and a much greater rate of network change," Mr. Dixon continues. "We're already handling about ten times more devices than two years ago. And we're eliminating paperwork and becoming more responsive.

"Our next step will be to automate the management of network change with Information/Management." ■

**INSIDE:** *Creating a big online system fast.... Help with IBM software is just a phone call away.... More application development productivity for large systems.*



# IBM Software Experts Answer the Call to Keep Systems Running Smoothly

It's 2:00 a.m. You're testing a new application on a tight deadline. Suddenly, something—you don't yet know what—triggers an "abend."

With software, that happens. Each new hardware configuration, new application, or different combination of software releases is a unique environment that may cause a previously hidden problem to surface.

So, to keep IBM intermediate and large system customers up and running, the skills of more than 1,500 software service professionals are always on tap. Part of the IBM National Service Division, these professionals have the full power of special data bases at their fingertips.

You pick up the phone and call a special 800 number. At any time, 24 hours a day, seven days a week, you reach an IBM support center in Chicago, Boulder or Tampa. These locations service IBM's MVS, MVS/XA, DOS/VSE, VM and VS/1 system products and the licensed products associated with them. The centers also service licensed products for the Series/1 and the 8100.

Often the IBM Program Support Representative (PSR) taking the call recognizes the problem and gives the customer a remedy. To help the PSR, IBM maintains a data base of symptoms and solutions for known problems. If the problem requires a revision to the code, the PSR has a Program Temporary Fix (PTF) sent to the customer by the fastest possible method—in some cases, by a telephone link.

Over 50 percent of problems are solved by the PSR. But when a problem is a new one, the customer is put in touch with a program

specialist, who often is located near the actual developers of the software product.

On the most severe problems—those which have halted processing—the first goal is to find some remedy, such as a bypass, that allows work to resume. The objective is to complete this within 24 hours.

The second goal for the program specialist is a permanent solution. When this requires a new PTF, the objective is to develop and test it thoroughly within 14 days. The specialist re-creates the problem, functionally tests the new PTF, and then runs "regression tests" to be sure the fix is reliable.

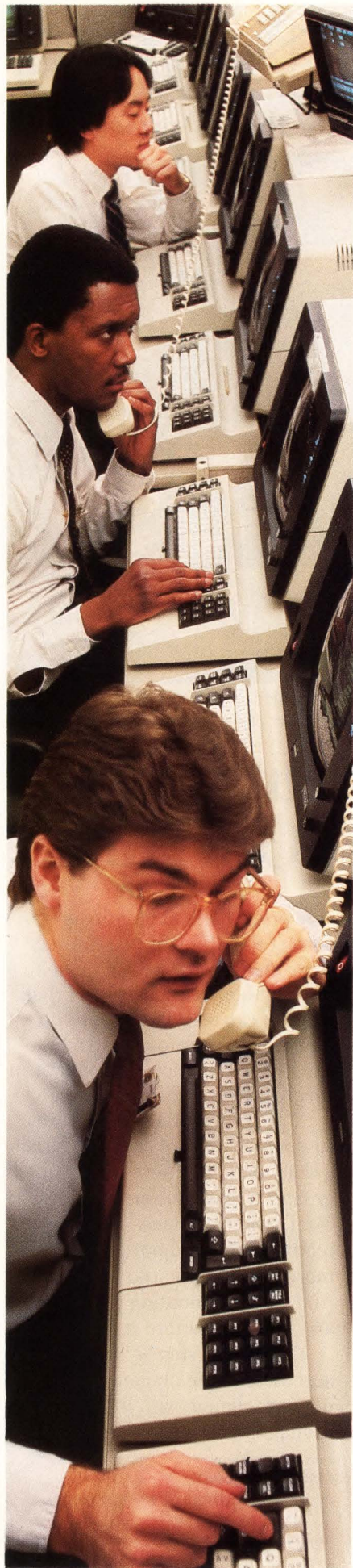
To close the loop, IBM periodically makes available service updates which combine all recent program changes. ■

## Cross System Product Set—Version 2 Recently Announced

With the recent announcement of Version 2, the IBM Cross System Product Set becomes a strategic productivity tool for large systems, as well as for intermediate and distributed systems. This application generator includes three licensed programs: one for creating applications, one for executing them and a third that permits end users to query the VSAM or CMS files.

The Cross System Product Set runs under all operating systems for 30XX and 4300 systems and under DPPX/SP in the 8100. With this version, support is added for IMS/VS/DB and DL/1 as data bases for CICS/VS. In addition, it has been enhanced to run in systems with large networks of terminals.

*To consult a data base of software symptoms and solutions, IBM representatives at customer sites talk by phone to these specialists.*





# Pacific Northwest Bell Uses ADF to Create A Large Online System Fast

"This is a very large and complex system," says John Osterfeld of Pacific Northwest Bell Telephone Company. "Yet we were able to implement it with 12 programmers—half of them brand-new to programming—in a total of 13 months from preliminary design to an online production system."

"It would have taken at least twice as long without ADF."

Mr. Osterfeld, a system analyst for Pacific Northwest Bell, is referring to IBM's Application Development Facility (ADF). Designed for users of the IMS/VS data base/data communication system, ADF greatly reduces the amount of programming required to create an application.

The programmers, under the technical guidance of Mr. Osterfeld, worked with ADF to develop a new version of the Customer Account Retrieval System (CARS) used by Pacific Northwest Bell representatives to call up account histories while answering customer inquiries

over the telephone.

"We were up against a hard deadline. The application had to replace an older version within 13 months," Mr. Osterfeld continues. "We had the choice of finding more programmers and training them in the application, or taking people who knew the application and letting them program."

"Fortunately, ADF simplified the IMS programming to the point where we could meet the deadline using some people with no programming experience at all."

"CARS now has several thousand users," Mr. Osterfeld points out, "and a very large data base. In our largest center, CARS handles 350,000 transactions a day—12 per second at peak times. So it is an application with a lot of demand on it. Execution has to be very efficient."

"And this version handles 28 I/O calls per transaction, compared to 20 or less in our previous system."

"In other words, the system as

## Simplify MVS Installations

The IBM Custom-Built Installation Process Offering (CBIPO) is a simplified packaging of MVS. A CBIPO can cut the time to install an MVS system or subsystem from weeks to days.

Conventionally, a major system change involves a separate tape, documents and installation procedure for each program product.

With CBIPO, you first select the program products you intend to use with MVS. Then, with an automated process, IBM custom-builds an MVS system consisting of the ordered products in the form of distribution data sets.

The CBIPO also includes customized documentation that provides a step-by-step single installation path.

written with ADF is actually more efficient in execution than the conventionally programmed system it replaces." ■

## IBM Software for your Business Professionals...

If you're interested in the growing information needs of business professionals, you'll be interested in *IBM Software Notes for the Business Professional and Manager*, an advertisement in recent business publications that featured these products:

- IBM's Query Management Facility (QMF). QMF is part of Dow Corning's end-user computing program. QMF lets employees do ad hoc queries on relational data bases.
- The Information Facility (TIF). Pratt & Whitney manufacturing experts create computer applications quickly, easily and in plain English.
- Info Center/I is a new functionally integrated decision support product, combining and enhancing three popular IBM products: ADRS, APL/DI, and FPS.
- The IBM Personal Decision Series (PDS) lets PC users perform a variety of tasks on corporate, departmental or personal data bases.

For literature on these products, check "Business Professional Software" in the coupon at the right.

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- ☐ ADF
- ☐ Cross System Product Set, Version 2
- ☐ CBIPO
- ☐ Business Professional Software

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(News continued from page 18)

## COMMODORE SETS AMIGA FOR MAC ATTACK

**A**lthough it is basically a machine for the home, the new Amiga microcomputer from Commodore Business Machines Inc., West Chester, PA, will give businesses an alternative to using Apple Computer Inc.'s (Cupertino, CA) Macintosh, Commodore claims.

The Amiga has the same easy-to-use icon interfaces as the Macintosh and is powered by the same Motorola 68000 chip. But, Commodore claims, the Amiga can run twice as fast as the Macintosh because the Amiga offloads control of disk-drive access, graphics, and sound output to three coprocessors. Among other advantages offered by Amiga, says Commodore, are its lower price (\$1,300 without monitor) and its color capabilities. The Amiga's internal

memory is expandable to 512 Kbytes; a 20-Mbyte hard disk will be available from Tecmar Inc. of Solon, OH.

Commodore is pitching the machine as a tool for presentations. The Amiga has special animation capabilities, it will be able to capture an image off a video monitor, and it can reproduce musical sound and human speech. In addition, the Amiga's operating system lets users run several applications simultaneously in overlapping windows on the monitor.

The drawbacks to using the Amiga are similar to those that face Macintosh users. The Amiga, with its proprietary operating system and 3½-inch disk drive, is incompatible with the IBM Personal Computer. Although Amiga

users can buy emulation software and a 5¼-inch disk drive to run IBM PC software, the emulation software is slower than if Amiga implemented emulation in hardware. In addition, no file-transfer package has been announced, and IBM software can't make use of Amiga's icon interface or multitasking features.

Commodore claims its new machine will be available in September. Much of the software initially slated to be available for the Amiga is for entertainment use; most heavyweight business-software vendors have not announced support. However, The Software Group, Ballston Lake, NY-based developers of the Enable integrated package, plans to release several business packages for the Amiga in the fall and winter.

Amiga will be sold in computer specialty stores. Call (215) 431-9100 for more information. □

## KAYPRO FINED

**M**icrocomputer vendor Kaypro Corp., Solano Beach, CA, recently had its wrists slapped by the California attorney general's office for allegedly threatening to terminate contracts with some of its authorized dealers caught discounting prices below suggested retail levels and selling to unauthorized outlets.

Without trial or admission of guilt, Kaypro agreed to pay the state \$19,500 in civil penalties and lawyers' fees and promised to refrain from any violation of California's antitrust laws.

It's common practice for micro hardware and software vendors to terminate contracts with authorized dealers that sell products to third parties—the gray market—which resell products for reduced prices. (See "Users sing the discount blues," May 7.)

Some see the ruling as a minor victory for the gray market and for users seeking lower prices. However, computer-law expert L.J. Kutten, St.

Louis, claims the ruling will only make "vendors more circumspect in terminating dealers in the future."

Vendors, Kutten explains, can set any reasonable business provisions they want in their dealer contracts. For instance, he says, vendors are allowed to terminate agreements with dealers for "legitimate business reasons," such as a change of market strategy. But vendors may not enter into a "conspiracy" to enforce termination provisions in their contracts. If a dealer complains to a vendor about the discounting practices of another dealer, leading to the latter's termination, that's conspiracy to fix prices. Kaypro could have avoided the penalty by terminating contracts under the guise of a new distribution strategy, Kutten says, "but they were clumsy."

The injunction against Kaypro stipulates that the manufacturer may not monitor the pricing of its dealers, nor may it terminate or threaten to terminate contracts with authorized dealers on the basis of pricing. Kaypro would not comment on the case.

—Anita Micossi

## TOO MUCH TECH?

**A**bout 20 percent of the hardware and software acquired by corporations in recent years was not needed. So says Vincent Sassa, a consultant with Halbrecht Associates, the Stamford, CT-based management consultancy, who claims that career pressure on MIS/dp professionals to stay current with changing technology has caused many corporations to overbuy computer equipment. Herb Halbrecht, president of the consultancy, says the traditional MIS specialist identifies with the field and the technology that drives it. As a result, he says, many MIS/dp managers urge senior management to acquire the latest systems even though the corporation's existing equipment may be adequate. Halbrecht says management should distinguish between the "techies" and the new breed of MIS/dp executives who identify with corporate goals and share senior management's bottom-line orientation. □

(News continued on page 26)



# Software AG Users spell it out...Datapro<sup>TM</sup> survey rates ADABAS

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## **ADABAS does it again— and we're not surprised!**

The results are in! Datapro Research Corporation asked systems software users to rate their data base management systems. And, Software AG users rated ADABAS "Excellent!"

Exactly the same thing happened in an earlier survey when Data Decisions asked users what they thought. For the third year in a row, ADABAS went right to the top of the list as the highest ranked DBMS for the IBM main-frame. And NATURAL was a top contender for best fourth-generation language.

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CD 0827



# NEWS BRIEFS

(News continued from page 23)

## SOFTWARE ON CREDIT

General Electric Co., Fairfield, CT, is offering, through subsidiaries, what it claims to be the first program to help corporations finance software acquisitions. Customers who buy at least \$70,000 worth of products from Software International Corp. (Andover, MA), a subsidiary of General Electric Software Products Co. that leases mainframe- and minicomputer-application software, are eligible for financing through General Electric Credit Corp. The purchase can be made up of any combination of Software International packages and hardware from other vendors financed through GECC. For more information, call (617) 685-1400.

## MIPS APPETITE KEEPS GROWING

The average large MIS/dp organization will increase its consumption of processing power by a minimum of 30 percent to 40 percent annually through 1988, according to a recent survey by International Data Corp., the Framingham, MA-based market-research house. Most of the increase in processing power, measured in millions of instructions per second (MIPS), will be consumed by distributed processing services, such as network-management software, database management systems, and applications-development systems, IDC says. This trend will be fueled by micro users looking for access to corporate data networks and mainframe-based applications.

## FAST MODEM FOR DIALUP LINES

A new modem speeds data at 10,000 bits per second (bps) over regular dialup lines, eliminating the need to install expensive conditioned lines. Irma Fastlink, a new 10,000-bps modem market-

ed by Digital Communications Associates (Alpharetta, GA), uses packet-switching technology developed by Telebit Inc. (Cupertino, CA). With a Fastlink modem at either end of the dialup line, such micro-to-mainframe communications as enhanced graphics transmission, distribution of software packages, file transfer, increased access to databases, and even local-area-network gateways to the public-switched network become possible. The new modems adjust speed automatically in case of line impairment, allow data to move in both directions simultaneously, and automatically correct all errors on retransmission. The modem includes two microprocessors and features Crosstalk-Fast, a special version of communications software Crosstalk XVI from Microstuf Inc. (Roswell, GA). Billed as one of the first "software-based" processors to support desk-top computers, the card version sells for \$1,995, and the stand-alone costs \$2,395. Telebit also sells the product as the Trailblazer. For more information, call Digital Communications at (408) 986-8000.

## REPORT GLARES AT VDT FILTERS

In many cases, there is no valid reason to install an antiglare filter on a video-display-terminal screen, according to Kathleen Potosnak, editor of the *Office Systems Ergonomics Report*. After reviewing the latest research on VDT glare, Potosnak concluded that it's better to simply turn down the lights than to install antiglare filters. All antiglare screens also degrade resolution, she says.

Bud Oddsen, vice president of Screen Data, a Whippany, NJ-based manufacturer of antiglare screens, denies his screens make characters harder to read. And work light frequently can't be adjusted because employees need more light to do other tasks, Oddsen adds. "When you turn down the lights, it's easier to read the screen, but you

can't read anything else on your desk," he says. Potosnak's report is published by the Koffler Group, a Santa Monica, CA-based consultancy specializing in computer and office ergonomics.

## EDIT FEATURE FOR DEC LINK

Users of DECnet/SNA Gateway, the software package from Digital Equipment Corp. (Maynard, MA) that connects DEC and IBM networks, can now edit documents transmitted via the link. Previously, users of the package could transmit only final-form documents between DECnet and IBM's Systems Network Architecture. The new editing feature is provided by External Document Exchange (EDE), a software product that resides on DEC VAX minicomputers. EDE is priced up to \$4,500. Documents created in DEC's WPS-Plus and All-in-One office-automation systems can be transferred to and from IBM mainframes running Distributed Office Support System (DISOSS), a software package that allows different IBM computers to share documents.

## USERS GRIPE ABOUT SOFTWARE

Users are much more dissatisfied with their vendors' software support than with their vendors' hardware support, according to a survey of 2,000 users by the Association of Field Service Managers, Fort Myers, FL. Forty percent of the respondents are dissatisfied with software support, particularly with delays in fixing software problems. Most users changed vendors for this reason. In contrast, only 15 percent registered serious complaints about hardware support. The most important criterion for evaluating software support, according to the survey, is the vendor representative's knowledge of the package. For more information about the survey, call (203) 744-5707. □



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that fit their products,**





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**"Better talk to**







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In fact, AT&T Computers can talk to IBM\* mainframes for easy access to host data using SNA/3270 or BSC/3270 protocols. Also available at a competitive price is the AT&T E4540 family of 3270-compatible controllers, keyboards and displays.

Our recently enhanced 3B Computers offer the performance advantage of UNIX™ System V in a departmental system, yet can be networked with existing MS-DOS\*\*-based PCs.

Built on the principle of non-obsolescence, the DATAPHONE® II System is a full line of high-performance modems, multiplexers, data service units, and diagnostic control devices. These combine data transmission and sophisticated network management capabilities, thereby maximizing uptime of either simple or complex networks.

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Taking advantage of the UNIX System's multi-tasking, multi-user features, the AT&T UNIX PC offers a unique combination of power, ease of use and communications capabilities.

Our UNIX System V-based 3B Computers—five new or enhanced supermicro and minicomputers—provide distributed and departmental computing at a competitive cost per user.

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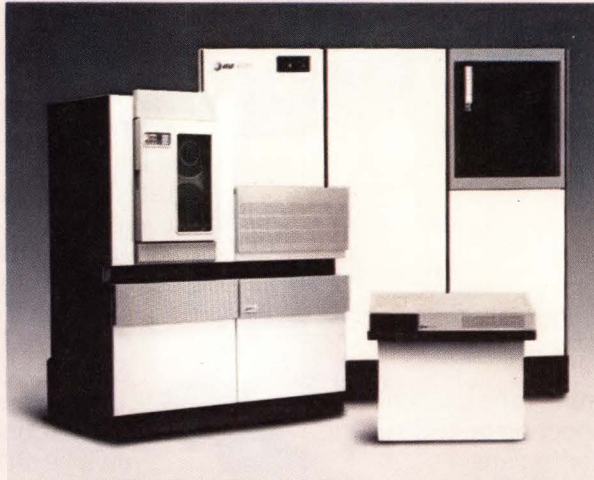
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# PERSONAL COMPUTING

by Marlene Nesary

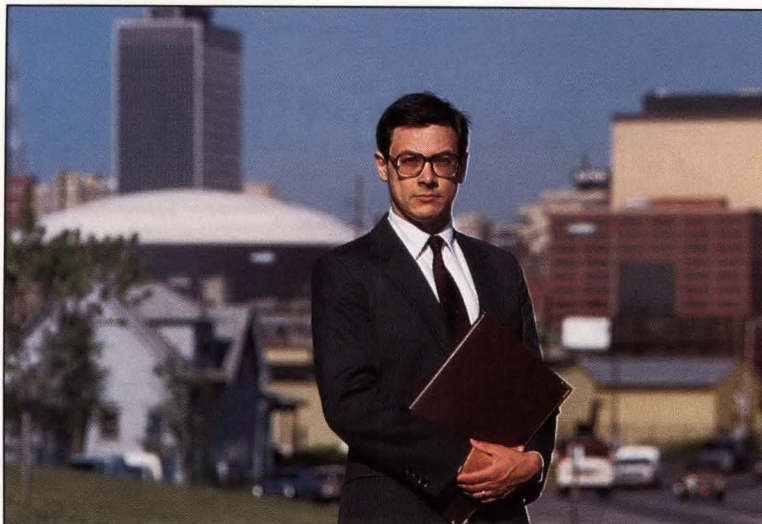


Photo by Mary Ann Carter

Eli Lilly's Rick Nashleanas likes Framework but has reservations about some components.

## FRAMEWORK: A GOOD FIT FOR A FEW

**F**ramework, the integrated-function package from Ashton-Tate (Culver City, CA), is an elegant solution looking for matching problems.

When it was first released in 1984, Framework won rave reviews and awards for its unique design. Unlike integrated packages based on spreadsheets, Framework has an innovative outline generator as its foundation. By basing its integrated package on an outline generator, Ashton-Tate has targeted Framework at users who work with words and concepts, such as those who produce technical and training documents and other written presentations.

But most corporate employees use their personal computers to crunch

numbers—witness the wide popularity of 1-2-3, the spreadsheet program from Lotus Development Corp, Cambridge, MA. Spreadsheet users looking for integrated packages are more likely to embrace Symphony, Lotus' integrated package, than Framework. "We're a number-based operation and already dependent on 1-2-3," explains Symphony user Dirk Gastaldo, an office-systems analyst at the Cleveland headquarters of Ernst & Whinney, the Big Eight accounting firm. "Employees here use Symphony because they're familiar with 1-2-3," echoes Alan Hey, microcomputer support analyst for Equitec Financial Services in San Francisco.

For many managers, the choice between Symphony and Framework was determined by the widespread use of 1-2-3. Symphony was a natural upgrade; in fact, Lotus offered an upgrade from 1-2-3 to Symphony for \$200, well below Framework's \$695 price. Although Framework followed Ashton-Tate's popular dBase II and III

micro database management systems, those predecessors didn't help foster acceptance the way 1-2-3 helped Symphony. Today, Symphony is more widely used in corporations.

Lotus has quietly taken steps to offset the uniqueness of Framework's outline generator. The latest release (1.1) of Symphony includes an optional text outliner. Even with the optional outliner, however, Symphony is still based on its spreadsheet.

"Framework is a supersolution looking for a problem to solve," says George Lanphere, a microcomputer administrator for Dallas-based Associates Bancorp. Critics of Framework say the outline generator is fluff. Outlining, they say, doesn't alter the rule of GIGO—garbage in, garbage out. Even users who are comfortable with the package's database, graphics, and spreadsheet components sometimes don't know how to take advantage of the outline generator.

(Continued on page 36)

*Marlene Nesary, who has installed and administered dBase III and Unix-based data-management systems, is a technical writer for One Point, a Walnut Creek, CA, distributor of micro business software. For more information about One Point, call (415) 947-0850.*



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(Continued from page 33)

Still, many users have found Framework to be a valuable tool. Rick Nashleanas, a systems analyst for Eli Lilly & Co., Indianapolis, calls Framework's outline generator wonderful. "With the outliner, I can create separate windows for conceptual 'what-if' scenarios, organizing, and thinking," he says. Nashleanas uses the package for capacity planning, quality assurance, and other analyses of mainframe performance, as well as for developing documentation.

Framework also holds some advantages over Topview, IBM's applications-management package, says Nashleanas. Topview allows users to "integrate" packages made by different vendors. "Framework users have only one set of interface quirks to learn," he says. "Its macro-language module [called Fred] lets users develop their own applications and macros," he adds.

Jim Beckstrom, a staff analyst for Michigan Bell Telephone Co., Detroit, is organizing a computer center for about 100 employees, most of them managers and new users. Framework is one of the first packages Michigan Bell decided to use at the center. "We chose Framework because learning time for one package is less than the learning time for five stand-alones," Beckstrom says. He is impressed by Framework's database module. "It's definitely easier to use than dBase II or III," he says. "You can see more of what's going on with the program right there on the screen."

Mark Polly, an office-systems consultant, has used and evaluated both Symphony and Framework for Eli Lilly. "Framework is easy to use," he says. "Anybody who uses both a word processor and a spreadsheet would find it helpful." Framework is a better package than Symphony, says Polly. "I don't think the Symphony spreadsheet is that much better," he says. "Symphony has a poor word processor, and

it's a lot less straightforward than Framework."

Rick Nashleanas does see a couple of weaknesses in Framework. He believes Framework's communications module, called Mite, is weak. "Mite is obviously an add-on," he says. "If you're going to do a lot of telecommunicating, buy something else." Mite, which was developed by Mycroft Labs Inc., Tallahassee, FL, is powerful and versatile, but its command structure is different from all other Framework modules, and the data-sharing operations between Mite and any other Framework modules are cumbersome. The degree of integration users expect from Framework is missing when they use Mite; as a result, the package as a whole loses some of its appeal, Nashleanas says.

Nashleanas also has reservations about Fred, Framework's macro-language module. Although he uses Fred to build menu masks, open and close windows, and make cross-frame references, he says working with the language module can be rough sledding. "Fred is more difficult to use than I thought it would be," he reports. "Framework's documentation gives some help, but it doesn't really cover the applications pertinent to Fred." One of the biggest problems with Fred is that it can cause the system to lock up if it is used extensively, Nashleanas claims. "When I know I'll be using Fred for a heavy session, I have to back up my work every half hour," he adds.

The relative merits and weaknesses of Framework aside, many corporations seem unimpressed by integrated packages in general. Managers wonder whether individual modules in a tightly integrated package like Framework or Symphony can deliver enough power to satisfy corporate users. As one MIS director asserts, "Anybody who uses a word processor or a spreadsheet needs the power of a stand-alone program."

When given the choice between im-

proved application integration and stand-alone power, many managers go for power. Some, like George Lanphere, believe integrated packages are wasteful because users often focus on one or two applications and ignore the others. "I don't need an integrated package," he asserts. "I'm comfortable with my stand-alone spreadsheet, word processor, and database program."

Many managers, like Dirk Gastaldo of Ernst & Whinney, believe individual applications in integrated packages don't have enough power to do the job effectively. Integrated packages need large amounts of random-access memory (RAM) to operate; users of IBM Personal Computers who create extensive data files can easily find themselves bumping their heads against the 640-Kbyte RAM ceiling posed by the PC's operating system, PC-DOS. The coming of hardware add-ons that can give IBM PC users access to up to 8 Mbytes of additional RAM should reduce some of the limitations presented by memory requirements of integrated packages. Lotus and Ashton-Tate have announced the coming of new releases of Symphony and Framework that will take advantage of the boost in available RAM.

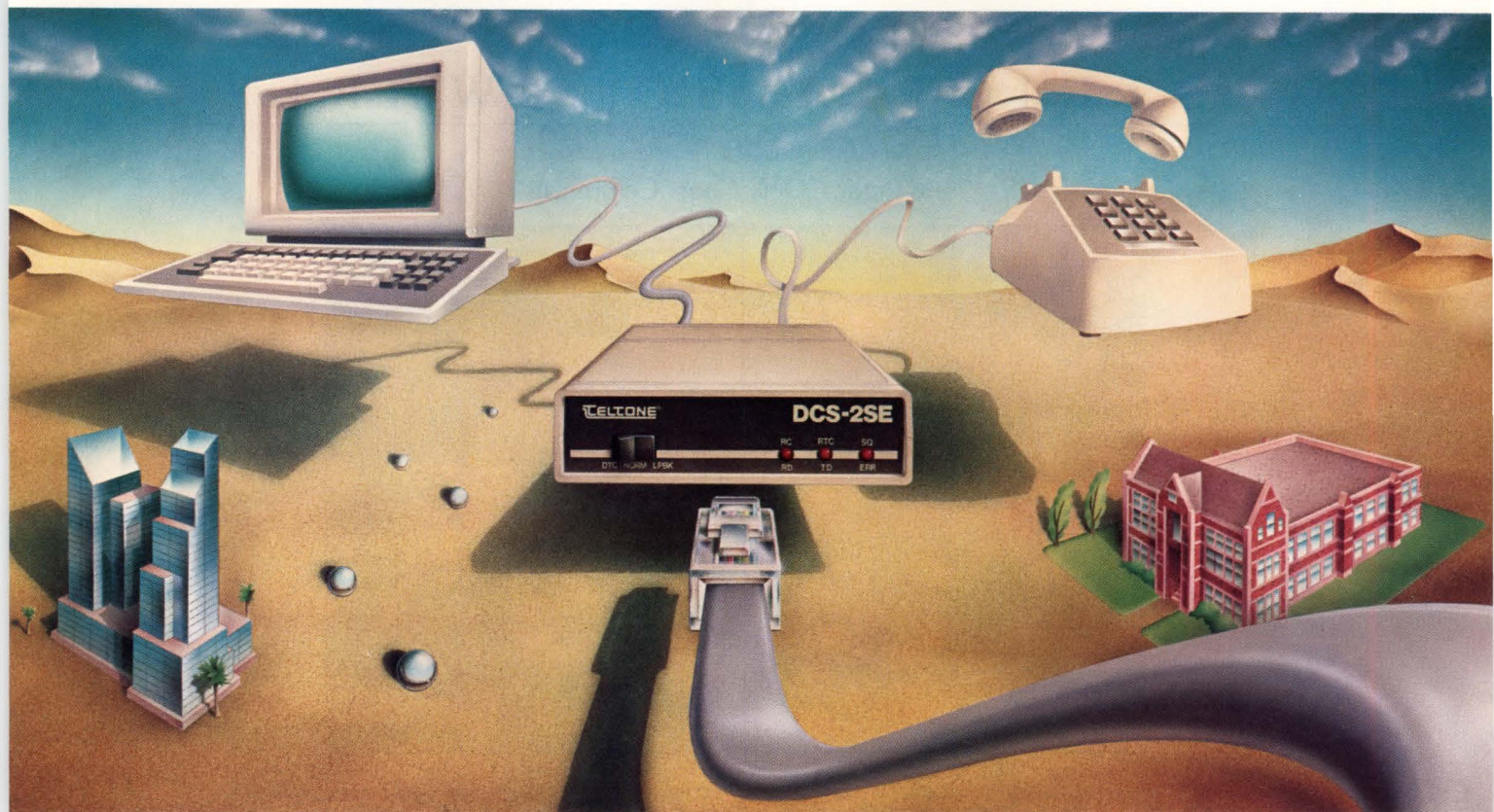
Still, managers have to question the cost-effectiveness of spending \$500 to \$700 for an integrated package with one powerful application and four or five weak or cumbersome ones. "Corporate managers are shying away from integrated packages altogether," says consultant Mark Polly, who adds that Eli Lilly decided not to install integrated software even though he recommended Framework. "The IBM Assistant Series is the closest we come to an integrated package," says Mary Lou Riley, systems analyst for Eli Lilly. Packages in the Assistant Series share common command structures, but are not integrated.

Integrated packages like Framework aren't the ultimate solution to business software needs; as a result, they may sustain only a limited number of users in the long run. That limited number, however, is likely to be enthusiastic and creative, the number crunchers with their Symphony and the "word" people with their Framework. □

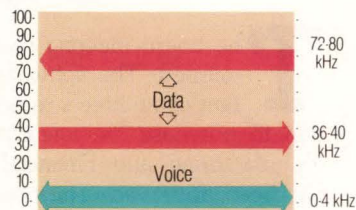
**"When given the choice between improved application integration and stand-alone power, many managers go for power."**



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# STRICTLY SOFTWARE

by Peter ODell, Guest Columnist

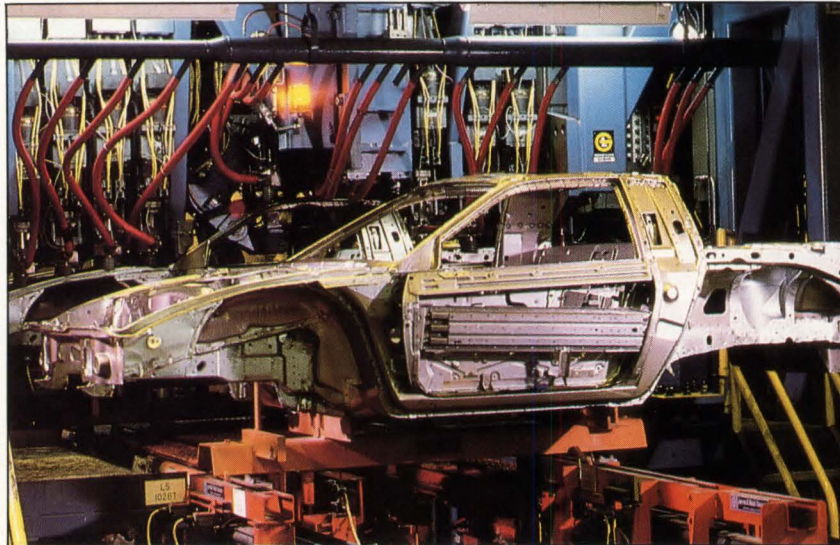


Photo by Andrew Sacks/Black Star

## MRP: LOOK BEFORE YOU IMPLEMENT

**T**he board meeting has just adjourned. The software evaluation committee's recommendation to purchase the integrated XYZ Manufacturing and Financial System has been approved. The project plan looks great and enthusiasm runs high. All that remains is to implement the new package, phase out the old system, realize the benefits, and pass out the promotions to all involved for their substantial contributions.

Hold the celebration. The most difficult part of the project, the implementation, is about to begin. Done well, it will enable the organization to reap huge savings on operating costs and to make better decisions based on more complete information. Gone awry, implementation can cost millions, waste countless hours, and sometimes even threaten a corporation's health.

Packaged software offers a host of advantages: Development costs are spread over many customers, often making packages less expensive than

homegrown software; packages have usually been tested in extended use and are generally more reliable; and the user spends no time in development, so packaged solutions can be up and running faster. But don't move too fast. A web of details still must be untangled for implementation to go smoothly. This is particularly true for manufacturing packages, which can include hundreds of programs affecting all of an organization's activities.

Manufacturing packages typically come in modules, or blocks of programs, each dealing with a specific function, such as purchasing, inventory control, and materials planning. Some also include modules for financial applications, such as general ledger, cost accounting, and accounts receivable and payable. Tying these elements together creates a so-called "closed loop" system, also known as Manufacturing Resource Planning II. MRP II allows a manufacturer to plan and control its entire enterprise with a single system.

Once a package has been selected and approved, organizations tend to start implementing it immediately. But haste can cause lasting problems, especially if product screening and selection yield only a superficial understanding of the package. Often, the group responsible for implementation does not include those who made the selection. The implementation team needs time to learn the system in detail—much more time than the selection committee needs to choose it. Selection committees usually formulate assumptions very quickly; verifying and acting on them may take months and involve many departments.

Upper management must be kept aware during the entire implementation process, not just fed an occasional progress report. Ideally, a senior manager should be directly responsible for the implementation project, making important decisions and bringing other functional managers into the process when necessary. Those managers who



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are ultimately responsible for using the system should "sign off" on the plan before implementing it. A project steering committee is an excellent way to get these managers involved. It should meet frequently to question and review the implementation plan developed by the project team. This approach can uncover problems early. It's also a good way to pass information to senior management and affected departments, paving the way for a smoother implementation.

Planners must resolve several issues before jumping into implementation. They may, in fact, need to reverse or modify decisions made during the selection process. First, planners must be sure of the project's goals and which specific business needs and functions the project addresses. In many cases, goals set during initial planning and product screening are really management's wish list or view of the ideal solution. What the corporation will fund is an entirely different matter. The successful project leader should resolve those differences, and direct the project team toward realistic goals.

Goals should be defined in enough detail so that progress can be easily measured. Usually, several key issues will determine whether the project ends on time or drags on for months or years after the scheduled completion date. These issues must be identified, planned for, and closely monitored. Item-master information, a list of all parts used in manufacturing and their associated data, such as order numbers, prices, and so on, must be put in proper shape for the new system. Unnecessary data from the old system should be purged, old information updated, and newly required data added.

Incomplete item-master information can delay the entire project. For example, the old system may not have required such information as the estimated annual usage or purchasing lead

time for each part, whereas the new system may. But not all new data required by the package may be critical. The purchasing module may need historical information about suppliers, for example, while all other parts of the package may work fine without it.

Major projects, completed months late at a cost that makes the original estimate look like a pittance, are tragically common. Many times, they stem from an optimism unrestrained by detailed planning. Other times, the project leader has been reluctant to tell management—or management hasn't wanted to hear—that the total cost in time and money is likely to be many times the estimate made by the selection committee or vendor. If the project leader meticulously plans a realistic budget and schedule, no one should be surprised by unexpected overruns. And if management is dismayed by the projections, it can jettison or cut back system features to reduce the time and costs. It's better that these tradeoffs are understood in the beginning, rather than have time and money run out before the system is complete.

No package will mesh exactly with the requirements of a complex business. Many corporations use a package as the kernel of their applications software and modify or extend it to meet their unique needs. Before implementation begins, the project implementers, with user and upper management involvement, must outline a clear policy describing the degree to which the software can be changed and in what ways operations must change to fit the software.

Some organizations commit to using a package without modification, saving on design and programming costs. This also helps ensure easy adoption of later program releases from the vendor. Significant changes to the software may well introduce incompatibilities with upgraded products. And vendors are reluctant to support a package that has

been altered by a customer. To avoid these problems completely, organizations might adopt a policy prohibiting any changes to a purchased package. If a modification the organization deems important would likely be desired by others, the vendor may be convinced to make the change itself, saving trouble down the road.

Changes having no impact on the underlying program logic, such as the reformatting of reports, don't pose the same potential problems as systems modifications; organizations can allow these changes without risk. Some organizations, however, are willing to completely dismantle packages and rewrite entire sections. This strategy must be undertaken with care, and only when the organization's requirements are so unusual that it's not likely to find a package that can be installed unchanged. Decisions about which sections can be modified should depend on business needs. Resources used to customize the accounts-payable module may be misspent, for example, if management's primary goals for the project are to cut inventory and improve control of shop-floor scheduling.

Perhaps the most difficult part of implementing a manufacturing package is instituting the necessary changes in long-standing business practices. Unfortunately, planning for this phase of implementation is often rushed, overlooking many problems that surface during or after implementation when the cost of solving them is high. Planning for operational changes requires a thorough knowledge of the package, good communications between users and implementers, a willingness to compromise, and a great deal of work. Upper management's involvement in both planning and execution is vital to the success of this process. Functional managers may have to explain why the new methods are better than the old. In many cases, individual departments will be relieved of some responsibilities, sacrificing some degree of power for the good of the organization. When this happens, it's especially important for management to substantiate the need for the change.

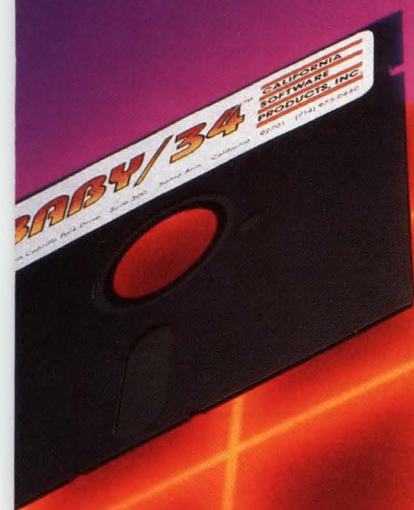
Implementation will affect many operational details. In many cases, new

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**The project leader must differentiate between what is hoped for and what the organization will pay for.**



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system features can coexist with the old procedures they were meant to replace. The work will get done, but the potential savings won't be realized. For example, a purchasing department's manual system may require that copies of every purchase order be sent to six different departments, which load them into six different filing cabinets. The new package may provide the same information online, allowing the six departments to call it up on a terminal when it's needed. That advantage will be wasted if the purchasing department continues to produce the now-superfluous copies. Implementers must examine these kinds of situations and work with user departments to eliminate outmoded practices.

Successful implementation requires training in the new methods. If the system's users don't learn its operation at

the start, an otherwise well-planned implementation will fail or drag on well past the deadline. Again, management support is imperative to ensure that department or functional managers put enough emphasis on training.

Implementers frequently scrimp on testing. Many project teams stop testing after confirming that a package works as advertised. The package's designers, however, may not have anticipated a typical conditions. The accounts-receivable module may work fine when a customer sends one check per invoice, but not when it sends a single check to cover five invoices and the amount doesn't match their total. The purchasing module may work fine if materials arrive after the purchase order is entered, but not if the situation is reversed. Implementation offers a chance to uncover the kinds of pro-

gram inadequacies that crop up.

A manufacturer can use variations on three basic implementation strategies. With the pilot-project approach, a small portion of the business switches to the new system, giving the implementation team a chance to evaluate the package under "live" circumstances without affecting the entire business operation. The functional area chosen for the pilot should test enough of its features to guide implementation of the entire system.

Under the most commonly used method of converting systems, the parallel approach, the organization runs new and old systems concurrently—finding and fixing bugs by reconciling discrepancies in the results. The main benefit of this approach is safety: The organization continues to function even if the new system bombs. This ap-

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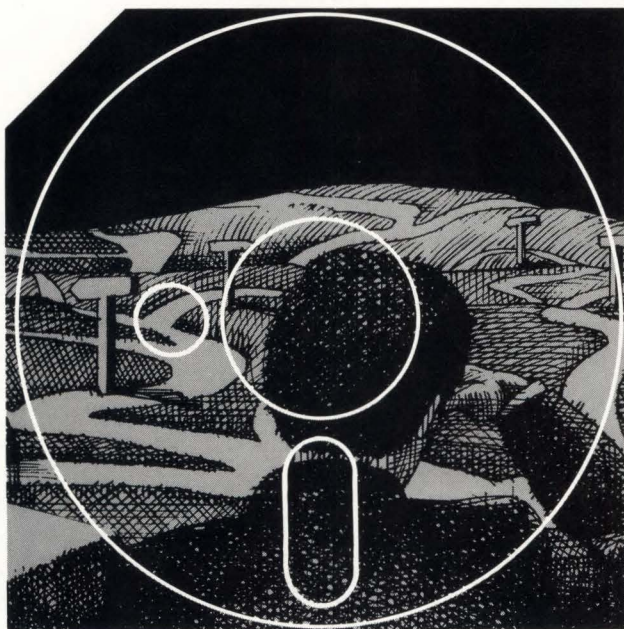
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CIRCLE 19

## S O F T W A R E

proach is hard on employees because it adds new parallel procedures to their normal workloads, both procedures will degrade over extended periods of duplicate operation, and users are apt to become frustrated and confused. The third approach drops the old system cold turkey. This can be dangerous. But with sufficient testing and planning, it can avoid the duplication of effort and business disruption inherent in pilot and parallel projects.

Many organizations follow implementation strategies made up of elements of all three basic methods, especially when the package comprises several modular subsystems. Critical subsystems, such as inventory control, may require a parallel implementation. However, the purchasing department might avoid confusion by converting all unfilled orders to the new system and severing ties to the old system at once. If the manufacturing plant operates several production lines, one line might serve as a shop-floor control pilot.

Timing is also crucial. For example, implementation of shop-floor control modules should take place at times other than high-volume processing periods. For the switch of financial modules, the beginning of a fiscal year is a good time because the need to convert data from one set of books to another is minimized. Cyclical industries may find their slack times of year best for implementing major packages.

Even the best plan and most careful implementation can go sour. The implementation team must be prepared with a contingency plan in case the new system fails. This plan should spell out methods for aborting implementation and returning to the drawing board. Without a contingency plan, implementers will be forced to solve problems on the run, delaying recovery for days. To ensure a fallback position, implementers should not burn bridges to the old system until the risk to the business is minimal.

If the new system is replacing only a portion of an old one, implementers will have to plan to integrate the elements. If the old system includes the downloading of information from the mainframe to a microcomputer spreadsheet, for example, the implementers may have to devise a link that allows the same transfer under the new system. Again, upper management has to determine the importance of such interfaces. The link may not be important enough to the business to warrant the expense of re-creating it. On the other hand, the interface may provide critical operating data to management that makes it a requisite of the system's implementation.

Manufacturing packages can alter the way a corporation fundamentally operates—a change that always involves a tremendous amount of concerted effort. Without good planning, frustrations will abound. Implementers will be forced to spend most of their time firefighting, leaving little time for making real improvements. Conversely, a carefully thought out implementation with strong backing from upper management can provide an organization with the information resources for better business decisions, reduced costs, and growth for years to come. Once the system is in place and providing those benefits, the celebration can begin. □

Guest columnist Peter ODell is director of technical services for Criton Technologies in Bellevue, WA.



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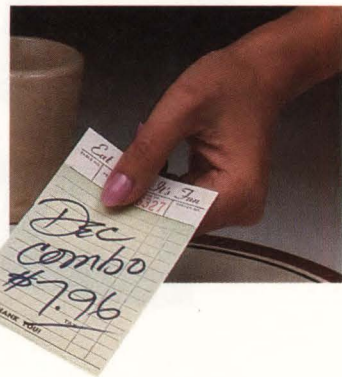
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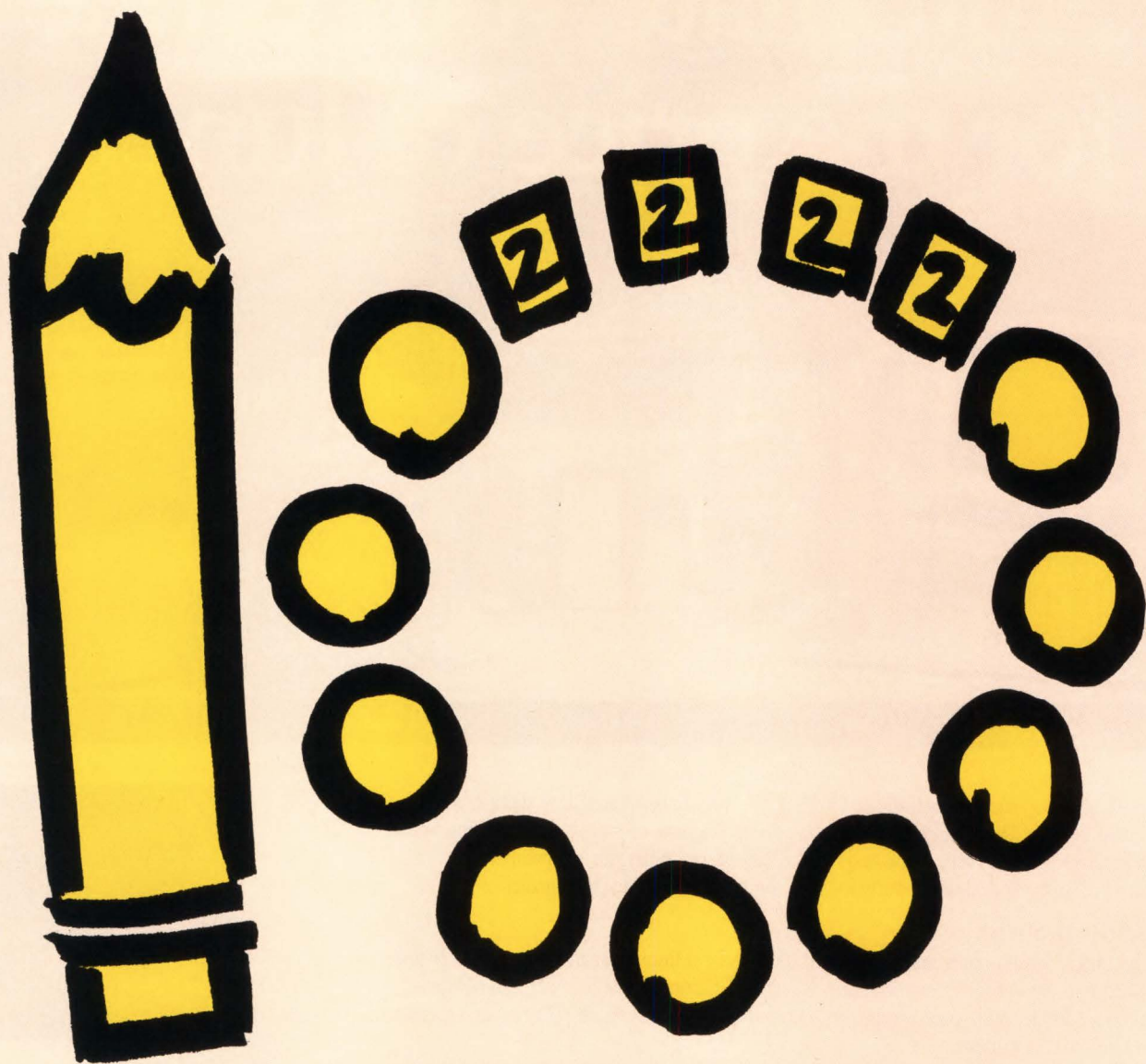
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# DATA COMMUNICATIONS

by John Seaman, Data Communications Editor



Photo by Andy Levin/Black Star

## AT&T OFFERS PUBLIC PRIVATE LINES

**A**T&T is on the verge of offering corporations a chance to make sections of its public network private. Software Defined Network Service, a new offering, will let users employ sections of the carrier's public network as virtual private lines, which in many situations offer greater cost efficiencies and more flexibility than private lines.

The new service is not yet available to all users; the Federal Communications Commission (FCC) is still considering AT&T Communications' (Basking Ridge, NJ) application to offer it. On June 20, the commission suspended AT&T's tariff for a software defined network. The FCC says it's concerned that local telephone companies may in some cases be bypassed by the new offering, and that AT&T may be able to use cross-subsidies to undercut potential competition. Until the FCC puts Software Defined Network Service and all similar offerings under tariff, AT&T is allowed to provide the service only to

"selected customers." Such customers include those that don't intend to bypass local phone companies and those whose use of the service won't pose a restraint on competition, the FCC says.

Software Defined Network Service essentially is a call-routing program and database for corporate users, giving users a way to expand their networks without waiting for private-line installations. With the service, users can reshape sections of the public network from a central location or from many sites, says James Byrnes, a spokesman for AT&T. Managers can redefine virtual private lines on the system using the Service Management System, a complete network-control system that gives corporations access to a database containing records of their virtual private-line networks and allows them to program necessary changes, says Byrnes.

"Software Defined Network Service offers improved service and relieves

the burden of a lot of traffic engineering," says the telecommunications manager for an eastern, Fortune 500 manufacturer. "It gives you access to the public-switched network and its infinite pool of communications lines." The manufacturer plans to use Software Defined Network Service to serve remote offices not on the corporate network. "For the first time, we'll be able to bring places like Rapid City, SD, into our network," the manager says.

AT&T's new service promises more flexibility for corporations with networks that carry a moderate load of communications between at least 20 locations. The service is also well suited to networks in which locations are frequently added, or in which the load on many circuits is too light to justify the cost of installing a dedicated private line. "Users can add locations, like new sales offices, as soon as the access lines are obtained," says Byrnes.

Byrnes says it probably will take

(Continued on page 52)



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(Continued from page 48)

users as much time to obtain access lines with Software Defined Network Service as it does to get private lines installed. AT&T has 600 service points to accommodate new links, he adds.

George Durar, a consultant at Communications Consultants Inc., Asbury, NJ, believes Software Defined Network Service will help network managers trim costs for small offices operating outside the corporate private-line network. Most offices too small to justify installation of private lines have only more costly direct-distance dialing and wide-area telephone service (WATS) lines, Durar says. "With Software Defined Network Service, you can include almost every site on the corporate network, making network management possible for each location," he adds.

With the service, managers can assign calling privileges or restrictions to specific employees or allow callers at any location to reach any other location on the corporate network by dialing a special seven-digit number, rather than the 11-digit number usually needed. Software Defined Network Service also provides reports on call patterns for the entire virtual private network. Reports can be prepared to accommodate the needs of different departments.

In most cases, AT&T believes it won't make sense to replace existing private lines with Software Defined Network Service, says Byrnes. But Durar says greater flexibility makes the service a solid alternative to private lines. "You have to maintain backups to private lines, and if the backup isn't available during a failure, service can be down for a long time," he says. "Software Defined Network Service greatly reduces the possibility of breakdowns. There's always an alternate virtual circuit available in the AT&T public network."

The costs of Software Defined Net-

work Service are more complex than private-line costs. Users will pay time and distance charges, plus charges for access lines. In contrast, private-line users pay flat monthly charges for point-to-point or multipoint analog or digital private lines that are available to them 24 hours a day. In both cases, network-management features are an additional expense.

As described in AT&T's proposal to the FCC, a four-minute call from Boston to New York made during business hours on a virtual private line would cost \$1.20. A similar call from Los Angeles to San Francisco would cost \$1.30, and a call from New York to Los Angeles would cost \$1.68. Fees include a set-up charge of \$105,000, and a fee of \$1,000 per site for up to 50 sites. The per-site charge drops to \$600 per site for 200 or more sites.

Service Management System, the network-control component, is available at an additional cost. For \$500 a month plus a one-time charge of \$125, corporations can set up and reconfigure virtual private networks from local control consoles or terminals. Corporations that pay for this service can use Service Management System free for one hour, but must pay \$1 a minute thereafter. AT&T will also set up and reconfigure networks from its own consoles or terminals for \$60 an hour.

"Large corporate users can save 10 percent to 20 percent using Software Defined Network Service, compared with average private-line costs," says AT&T's Byrnes. Savings are made possible because the service can use several access modes, including standard access, private-line access, and third-party access.

Standard access is like the access mode used for WATS lines. Although the connections are switched by local phone companies, they are dedicated to Software Defined Network Service.

AT&T must use local phone companies to provide standard access to its new service. So far, only Northwestern Bell Telephone Co., Omaha, NE, has said it will offer standard access to users of Software Defined Network Service, but the other local phone companies are expected to follow suit after the tariffs are settled. Standard access allows data-transmission speeds of up to 4,800 bits per second (bps). Although it is the most expensive method, standard access is also the most cost-effective way to tie small sites into a corporate network using Software Defined Network Service.

For private-line access, a dedicated line is tied into Software Defined Network Service. Sites using private-line access should have enough communications traffic to justify the expense of a private line. Data-transmission rates of up to 9,600 bps are possible through private-line access.

Users can also arrange for third-parties to install links—like high-speed T-1 lines—to Software Defined Network Service. If a corporation finds its traffic load is great enough to warrant the installation of a T-1 link, the initial higher cost of the link can be justified because T-1 lines offer the cheapest access method. Data-transmission rates of about 1.5 million bps are possible over T-1 lines.

Durar believes the benefits of Software Defined Network Service are worth the costs. He adds users shouldn't worry about soaring phone rates driving up the cost of such services. "Dedicated lines are no insurance against increases," he says.

Software Defined Network Service may also turn out to be an important transitional offering. AT&T's network is analog, but Software Defined Network Service's interfaces with it—including the switches—are digital, creating the possibility that the offering could eventually be used for integrated voice, data, and video communications. The unnamed telecommunications manager believes AT&T's new service may become the eagerly awaited integrated services digital network (ISDN). "Software Defined Network Service is a natural segue to ISDN," he says. "It's a step in the right direction." □

**"With Software Defined Network Service, you can include almost every site on the corporate network."**

*Durar, Communications Consultants*





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# FOLLOWING THE LEADERS

by Lee Keough, Industry Editor



Photo by Dario Perla

ADR's Martin Goetz (left) and John Bennett stress product development over marketing.

## ADR: ARE FIRST-RATE PRODUCTS ENOUGH?

**W**ith a highly regarded product line that's expected to be in big demand, Applied Data Research Inc. (ADR) is poised to become the leading independent vendor of systems software. To achieve its goal, the Princeton, NJ-based software house must overcome two obstacles: the current downturn in the computer industry, and ADR's own propensity for emphasizing product development over marketing.

Although ADR traditionally gets high marks for its software, analysts say growth has been slowed by a lack of marketing prowess. This year, ADR set out to overcome its deficiency by increasing its advertising budget and expanding user support programs. With a combination of a superior product line and new-found marketing muscle, ADR executives projected the corporation would increase earnings and revenue by 45 percent, matching 1984's performance.

Despite its efforts, ADR is falling

short of its goal. Revenues have increased, but not enough to offset the bigger budget. ADR surprised observers by reporting a second-quarter loss of \$3.1 million on revenues of \$30 million. For the first six months of the year, ADR's revenues total \$64.4 million, an increase of 28 percent over the first half of 1984. But the corporation has posted a first-half loss of \$2.6 million; in the first half of 1984, the corporation earned \$2.0 million.

Based on ADR's weak first-half showing, John R. Bennett, ADR's chairman and chief executive officer, has revised revenue forecasts downward. He now expects both revenues and earnings to increase by 30 percent for the year. Bennett also says the corporation will cut expenses to meet projected per-share earnings for the year.

Bennett's primary target for cutting is the marketing budget. Bennett says although ADR's marketing budget will still be larger than last year's, much of the increase planned for nonessential

marketing and user support programs will go.

Bennett admits solid marketing programs are important, particularly as IBM eyes software as a major growth market. But, he argues, ADR's emphasis on product development has served the corporation well. ADR claims to be the first independent software vendor, having marketed a package in 1965, five years before IBM sold software separately from hardware.

Technological expertise helped ADR become one of the first vendors to offer a relational database management system (DBMS). Relational DBMSs like ADR's Datacom/DB offer improved performance over hierarchical systems. IBM's slowness in developing DB2, its relational DBMS, has given independent vendors like ADR a head start in marketing their systems. IBM still dominates the mainframe DBMS market, but its share is slipping. Martha Rounds, senior research analyst at In-

(Continued on page 57)



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# OFFICE AUTOMATION

by Jennifer E. Beaver, Office Automation Editor



## DISTRESS AND THE OTHER STRESS

**A** piece of popular fiction—that computers cause stress—is taken for gospel by many managers. If each workstation comes with built-in anxiety, they may reason, stress is unavoidable. This fiction lets them sidestep responsibility for such stress-related problems as falling productivity and high absenteeism by blaming the technology or the hardware. What these managers don't realize is that the stress employees feel is due to the changes technology brings, not the technology itself. But change is a constant in the automated office.

Management's goal shouldn't be to eliminate stress, but to channel it. Stress is a necessary survival mechanism that's dual in nature: What is commonly referred to as stress—anxiety, strain, and discomfort—is really distress. There is such a thing as “good” stress. Called eustress, it's a motivational factor that is often overlooked by management. Eustress is the positive response to problem-solving and challenge.

Channeling eustress will help assure than an investment in a new system pays its promised dividends. Eustress and bottom-line concerns go hand in hand. The success of automated tools is never assured, and the attitudes and feelings of the employees who run them are factors that can put an organization's OA investment at risk. New office systems create new, and sometimes additional, roles for the same players. Established, comfortable relationships and office routines undergo metamorphoses that, undirected, cause employee distress. If employees perceive the new system and all it brings as a threat, they will avoid using it. But employees who see the new office system as an opportunity to expand their skills and knowledge and create new niches for themselves in the organization will ap-

proach it with hopeful enthusiasm.

Taking a look at what Tom McDonald, president of Transition Associates, management consultants in La Jolla, CA, identifies as the four major changes introduced to offices by OA, it's easy to see how eustress is often difficult to identify and bring out. The positive aspects of change are easily obscured by doubts and anxiety.

- *New job skills.* Learning new skills can bring out the insecurities in most employees. Often, the higher an individual is in the organization, the more difficult it is for him or her to accept the need for new skills. Most organizations introducing automation to managers and executives today confront resistance.

- *New communication networks.* Ideally, new communications facilities will enhance long-standing links between managers and employees. Such “networks” exist in every organization, often informally. However, too often new networks enhance the transfer of data but disrupt important informal

**There is such a thing  
as “good” stress.**



connections that contribute to effectiveness and team spirit.

- *New productivity standards.* Productivity often is equated with speed. With a computer system, employees may be expected to reach not their own peaks, but the *system's* peak. This puts unaccustomed and perhaps unfair pressure on employees, especially when they are expected to maintain their regular levels of production and learn a new system at the same time.

- *Access to new information.* Information is increasingly becoming the corporate lifeblood. Employees who have the information they need are potentially more effective than those who don't. Yet access to information may also disrupt existing superior/subordinate relationships, which may be viewed by both as threatening.

Many major corporations have given MIS/dp responsibility for making OA pay off. It's difficult for MIS/dp managers to help user departments capitalize on eustress. Most MIS/dp departments are themselves besieged by advancing technology and methods. Realistically, the task of managing automation distress and eustress is more likely to fall to departmental managers who are in the trenches with the new equipment.

An approach to minimizing the effects of distress is to provide tension-relieving programs for employees. Most corporations confront the evils of distress only at the top—for executives facing the pressure of rapid-fire decision-making. Such perks aren't usually available to office workers, although they spend all day hunched over keyboards staring at glaring screens.

American Express Co. Inc., New York, decided to investigate the link between OA-related distress and performance. At its operations center in Phoenix, American Express brought in Denise Austin, a fitness expert who specializes in exercises for employees who work at terminals. Austin showed 4,000 data-entry clerks and telephone operators how to release the tension that builds up in the shoulders, neck, back, and eyes due to long stretches in front of the terminal. Austin's set of exercises take five minutes.

At 10:10 a.m. and 2:10 p.m. every work day trained volunteers, accompanied by music, lead the group in exercises at the terminals ranging from shoulder rolls to leg lifts. In a three-month follow-up study that measured the effects of the exercise program, American Express discovered that the operators averaged 5.5 percent more keystrokes per day and that morale had improved. (Austin's exercise manual is available for \$1.50. Write to Tone Up at the Terminals, P.O. Box 3771, San Clemente, CA 92672.)

Distress is not built into every computer. And it's not just manageable, it's avoidable. Certainly managers face distress problems too complex to be solved by exercise routines or even fitness programs, but effective solutions must be sought. The reward will be a reaping of the promised benefits that OA too often fails to provide. □

(Continued from page 54)

ternational Data Corp., a Framingham, MA-based market-research house, says IBM's market share has dropped from 64.6 percent in 1983 to 53.2 percent. Rounds says ADR now holds a 4.9 percent share of the installed IBM-mainframe DBMS market, up from 3.8 percent in 1983.

Although Datacom/DB is largely responsible for ADR's 87 percent growth in revenues since 1982, ADR has yet to reach its full potential in the mainframe DBMS market. Buyers of relational DBMSs have been primarily businesses upgrading from file management systems like VSAM; corporations already using hierarchical DBMSs have been reluctant to upgrade to relational systems because the conversion process is so expensive. ADR recently introduced a translation package, DL/1 Transparency, that lets users of DL/1, IBM's hierarchical DBMS data language, automatically convert data on their hierarchical systems to relational systems. Analysts expect DL/1 Transparency, which is priced at \$30,000 to \$40,000, to open a huge new market for ADR.

Ideal, ADR's fourth-generation language for developing application programs, has also been a major contributor to the vendor's revenue surge. Recently, ADR purchased a license for Progress, a fourth-generation language for microcomputers from Data Language Corp., Billerica, MA. ADR plans to modify Progress to make it compatible with Ideal and release it as PC/Ideal.

"This is as strategic an acquisition as our purchase of Datacom technology in 1978, which we developed into Datacom/DB," says Martin Goetz, a founder of ADR, who now serves as president and chief operating officer. PC/Ideal will let users develop applications for micros using mainframe data.

Although ADR is primarily a systems software vendor, it also markets non-industry-specific application software, including word-processing packages and decision-support software. But focusing on systems software is one of ADR's greatest strengths, says Bennett. "The issue is how to cut down on the applications backlog," he says. "We provide the tools to do it, and we don't want to be diverted."

Despite the recent revenue setbacks, ADR does not plan to curtail its efforts in product development. ADR's long-range plan is to offer systems software that can be used on any computer. As a step toward this goal, the vendor is currently developing a relational DBMS that can run under Bell Labs' Unix operating system.

Such development efforts are expensive, and ADR has a large research and development budget. In 1984, research and development costs amounted to 16.7 percent of revenues, among the highest for U.S. corporations. Analysts question whether ADR's relatively heavy spending on product development will give it an edge in the market. IBM continues to dominate with a product line many experts consider inferior to ADR's.

Bennett says ADR will continue to emphasize technology over marketing, and believes that's the way ADR's customers want it. "We're not a buy-'em-a-drink kind of company," he says. "State-of-the-art products are more important to customers than marketing hype." □



# NON-IBM MICROS: TO BUY OR NOT TO BUY ?

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*Conventional wisdom says to stay with IBM, but some managers are finding it pays to leave the mainstream.*

by Robert A. Moskowitz

**N**o one ever lost a job for choosing IBM. Purveyors of this conventional wisdom say managers who buy any microcomputers other than IBM Personal Computers invite trouble. Corporations that stray from the IBM fold risk falling out of the mainstream of micro hardware and software development. They may find themselves with machines that become obsolete quickly or, worse, become orphaned after vendor failures.

Yet IBM isn't always the best microcomputer buy. Corporations with non-IBM minicomputers and mainframes are often better off installing micros compatible with their bigger machines. Some users need specific features, such as portability or advanced graphics, that "off-brand" micros are better equipped to provide.

Managers who look beyond IBM for personal computers must contend with the risks they may incur in buying off-brand micros. In many cases, managers have strategies to minimize risks; in other cases, they've found risks to be less serious than expected.

IBM's domination of the micro arena

has made life easier for corporate managers. The presence of a de facto standard has helped bring some order to the microcomputer industry. Managers can keep their organizations in the mainstream simply by following IBM's lead. In a May 1985 survey conducted by Newton-Evans Research Co. Inc., Ellicott City, MD, 98 of 101 MIS/dp managers from Fortune 1,000 corporations said that their organizations use IBM PCs, and that an average of 76 percent of their organizations' micros were made by IBM.

Corporate managers aren't IBM's only followers; most of IBM's competitors have also rallied behind the PC standard, leaving managers with few alternatives to the PC's MS-DOS-derived operating system. Only one big microcomputer vendor, Apple Computer Inc., Cupertino, CA, has refused to jump aboard the PC-compatibility bandwagon. Many competitors, including Compaq Computer Corp. (Houston), Texas Instruments Inc. (Dallas), Digital Equipment Corp. (Maynard, MA), Hewlett-Packard Co. (Palo Alto, CA), and AT&T (New York), offer mi-

croscos fully compatible with the IBM PC. Some vendors that initially chose not to offer IBM PC compatibility, like Tandy Corp. (Fort Worth, TX), have since reconsidered and now sell PC-compatible models.

The benefits of an IBM standard have a price for MIS/dp managers. As the IBM PC became a benchmark machine, most independent software developers began writing software exclusively for it and its operating system. Unfortunately, the IBM PC is not the best computer for many applications, and MS-DOS is not the best operating system for some applications. If managers buy non-IBM micros to make the match between machine and application more ideal, they risk falling out of the mainstream. Fortunately for managers, many manufacturers offer special or improved features to mitigate the risks of bypassing IBM.

Organizations that use non-IBM minicomputers or mainframes can find in off-brand micros smoother, simpler communications links to their bigger machines. For instance, Hewlett-Pac-

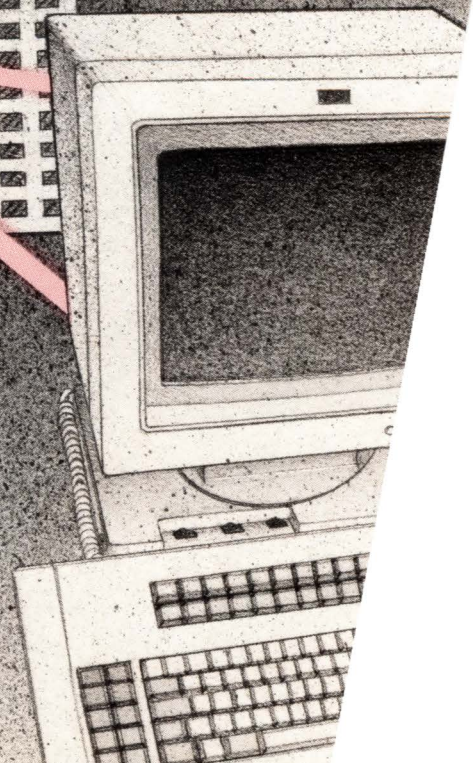
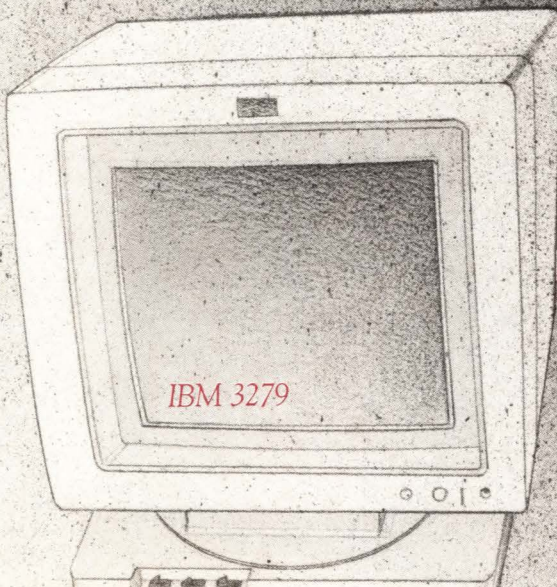
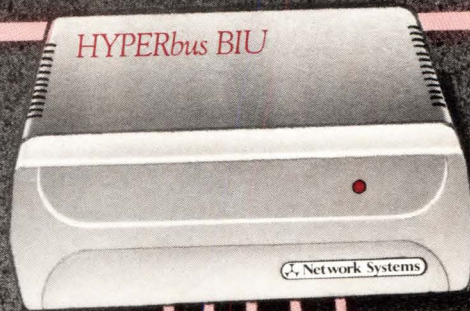
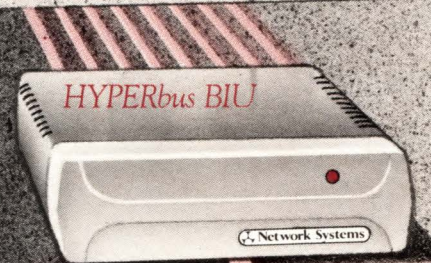
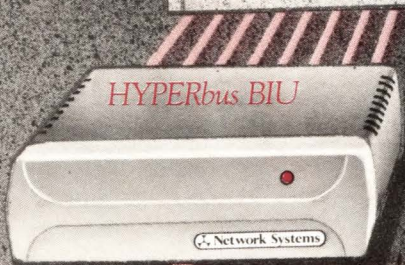
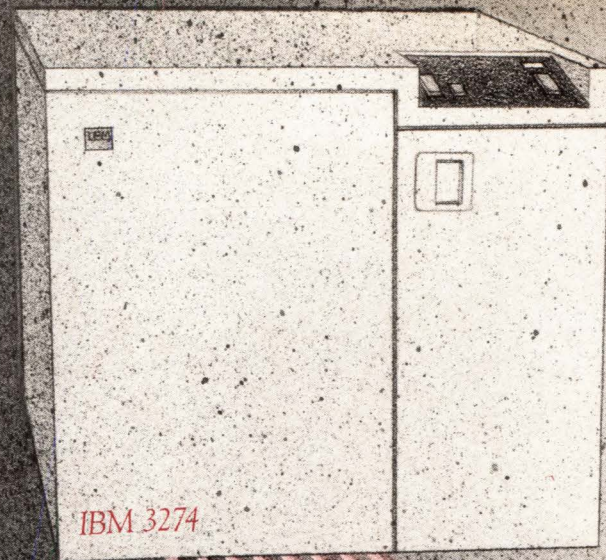
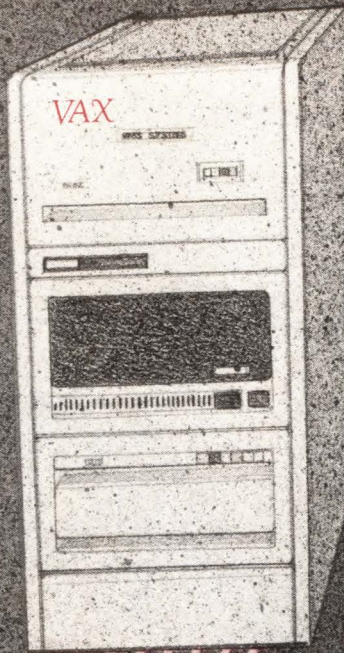
*(Continued on page 62)*



Photo by Ted Hardin









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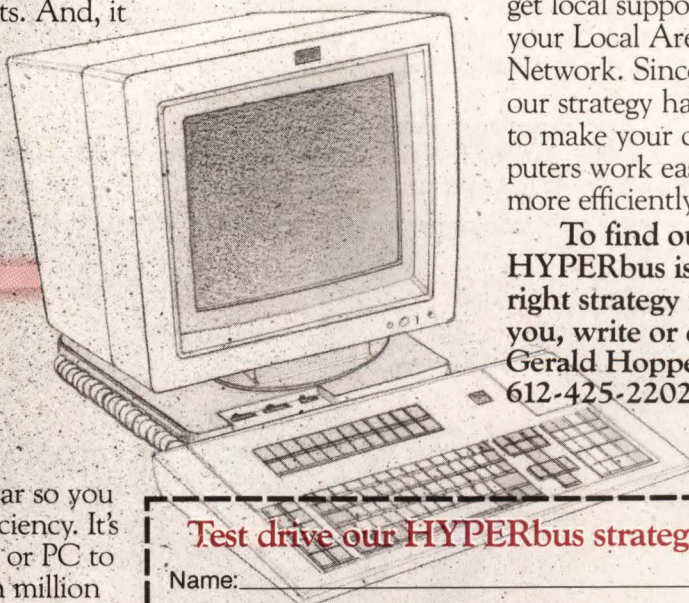
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# RISKY BUSINESS?

(Continued from page 58)

kard's micros offer built-in terminal emulation for use with the vendor's mini-computers. Although IBM PCs and other brands of micros can emulate Hewlett-Packard terminals if equipped with adapter cards, the built-in capability generally works much better than add-on emulators.

"We try to get all our micro users to communicate with our mainframe," says Doug Wakefield, technical support administrator for the Lansing, MI, Board of Water and Light. "Because we have a Sperry mainframe, we use Sperry microcomputers."

Some managers report that user departments prefer micros made by the same vendors that supply their mini-computers and mainframes, no matter what the advantages or disadvantages. "In our organization, departments that use Hewlett-Packard minis tend to choose Hewlett-Packard micros for their workstations, and groups with DEC minis tend to select [DEC] Rainbows," says Michael Abbene, information-systems manager for Monsanto Co., the big St. Louis-based chemical producer.

One of the chief advantages many non-IBM micros offer over the IBM PC series is ease of use. As more nontech-

nical employees demand and get microcomputers, ease of use takes on greater importance. Hewlett-Packard's touchscreen models and Apple's Macintosh, with its mouse cursor-controller, are two alternatives to the standard keyboard interface. Hewlett-Packard has integrated its touchscreen, originally a standard but dead-ended feature, into an open-ended package called the human input loop, which allows users to configure their micros with several different interfaces, including touchscreen, mouse, graphics tablet, and other specialized input systems. IBM has nothing comparable for users who prefer not to use keyboards.

Most off-brand micros offer some degree of IBM compatibility, emulation, or similarity, but the Macintosh represents a whole new approach to control. "A lot of our users find the Macintosh is much easier to use," says Alan Chase, manager of distributed systems support for Eastman Kodak Co., Rochester, NY.

Although the Macintosh's incompatibility with the IBM PC is an obstacle to its acceptance by most users, some find its ease of use too inviting to pass up. At Corning (NY) Glass Works Inc., one group of engineers chose to use Macintoshes instead of IBM PCs mainly be-

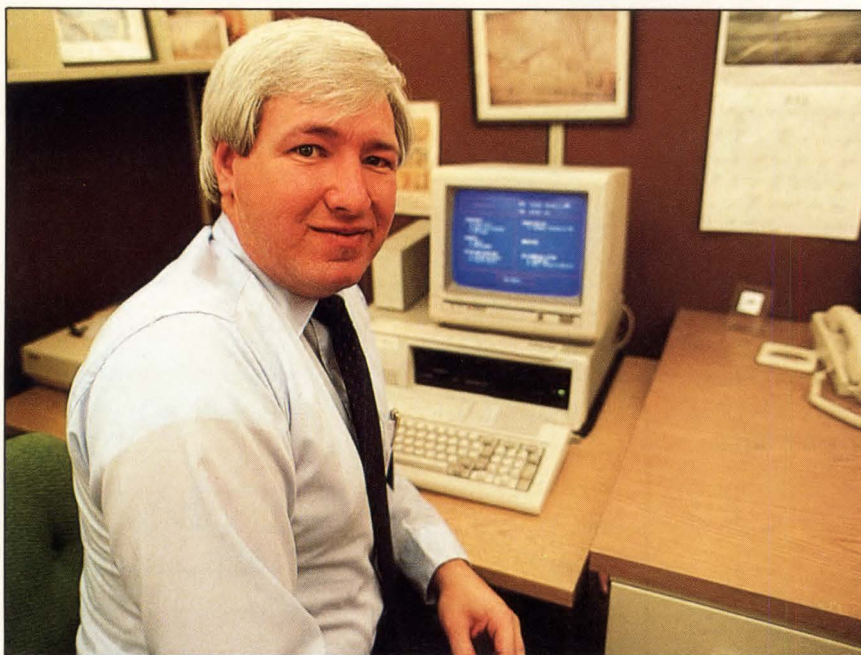
cause the system is easy to learn. "They want to be able to remember the little-used commands without a lot of retraining," explains Dennis Lockard, manager of professional and office systems at Corning Glass. "If a Macintosh work-alike had been available for the IBM PC, they would have selected that."

Aside from its ease of use, the Macintosh, with its 32-bit processor, generates graphics the IBM PC can't match. At San Francisco-based Bank of America, the Macintosh was recently added to the list of approved hardware for stand-alone graphics applications, according to Jim Gross, group systems manager. Gross says the addition of the Macintosh is a significant step for the bank. "The IBM PC is our desk-top standard, mainly because we have a very large investment in IBM mainframes," he says.

Portability may be the biggest reason to look beyond IBM for micro systems. Although IBM has a portable version of its PC, other vendors offer compatible models that are less expensive and outperform IBM's offering. Compaq and Kaypro Corp. (Solano Beach, CA) sell portables complete with hard disks, making them compatible with the IBM PC XT, and Compaq offers a portable compatible with IBM's fast new PC AT. The Newton-Evans survey of Fortune 1,000 MIS/dp managers shows large organizations aren't afraid to stray from IBM when they perceive another vendor has a superior compatible product. Fifty-three percent of the managers surveyed said their corporations use micros from Compaq, which has become the leading vendor of PC-compatible portables.

"You can stand in the lobby any night and watch the Compaqs leaving the building," notes Lockard of Corning Glass. "Portables support a fundamental change in the way people work. With portables, employees can spend eight hours working on a computer at the office, and then get some extra hours at night and on the weekend without having to buy a second system."

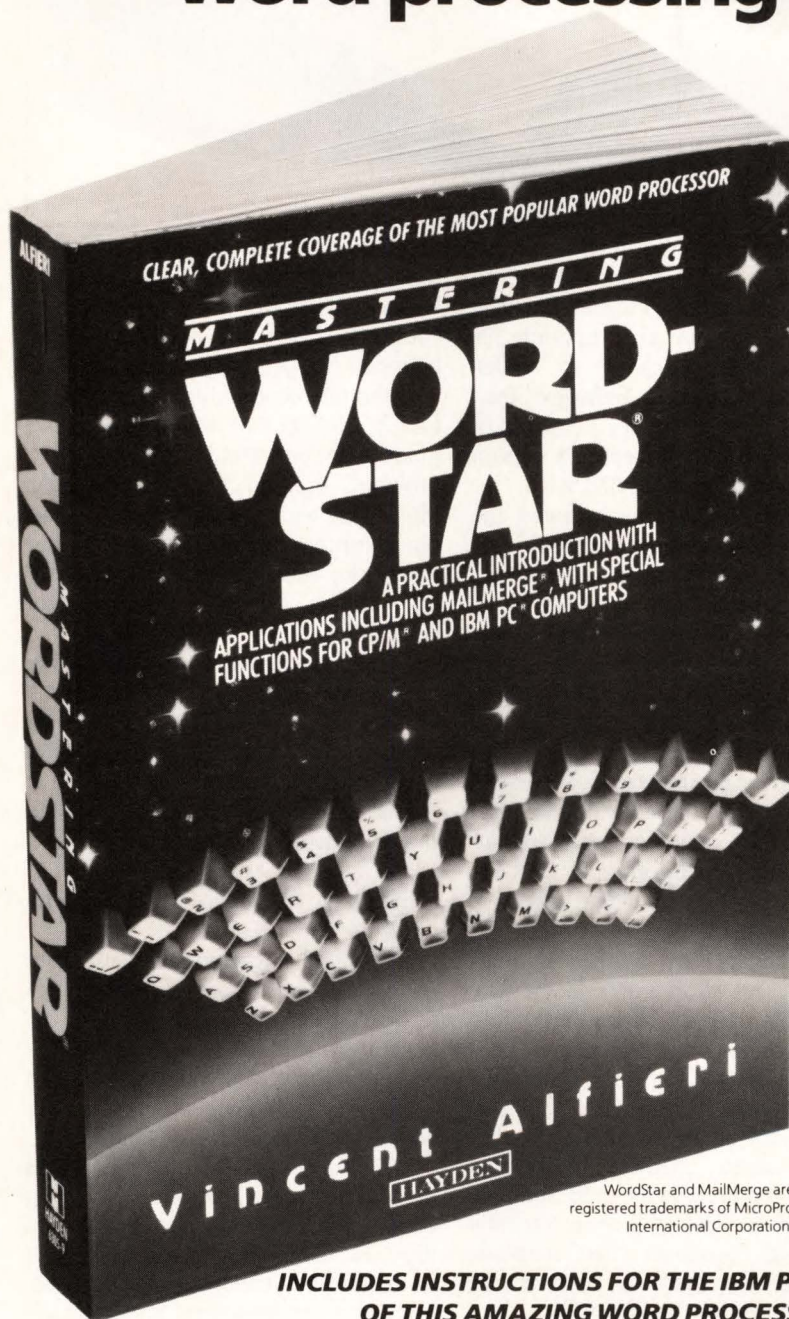
Organizations looking for lightweight portables for field work have no choice but to buy off-brand models. Several



Microcomputers don't become useless simply because vendors stop supporting them, says Michael Abbene, information-systems manager at Monsanto Corp.



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# RISKY BUSINESS?

vendors, including Hewlett-Packard, Data General Corp. (Westboro, MA), and Grid Systems Corp. (Mountain View, CA), offer micros that weigh 10 pounds or less and run on batteries.

The biggest risk when buying non-IBM micros, particularly incompatible models, is being left behind when IBM PC hardware or software is improved or changed. IBM PC users know their machines will be included in future communications systems, like local-area networks and micro-to-mainframe links. Users of off-brand micros don't have that assurance. At Chemical Bank, New York, IBM PC users can transfer files between their micros and the bank's IBM mainframes, but users of Wang Professional Computers and DEC Rainbows can't. Bank of America has stayed mainly with IBM products to ensure its ability to develop an effective integrated-office system, says Jim Gross. "Other micros can provide equivalent stand-alone functionality, but they may not be able to fit into an IBM architecture," he says. "The interfaces might be so complex as to be beyond the average user."

But large organizations rarely find one vendor—even IBM—that can meet all their needs. Like Bank of America, many businesses are supplementing a base of IBM micros with a limited number off-brand micros to perform specific jobs. Such a strategy allows organizations to take advantage of the strengths of off-brand machines while staying in the mainstream. "We don't think there is any one vendor to solve every problem, but we like to focus on just a few," says Eastman Kodak's Chase.

Of course, compatibility does not guarantee equality of performance. "Putting the box on the desktop is one thing, but getting different machines to share data and software is something else," says Chase. Moving data disks and software from one vendor's microcomputer to another's can be expensive, difficult, or impossible. For example, although DEC's Rainbow micros are PC compatible, they cannot read the double-sided floppy disks commonly used with IBM PCs.

Off-brand users may also find themselves locked out of more advanced



software packages that may come out in the future. Abbene says a Monsanto executive who used a Hewlett-Packard HP-150 micro wanted to upgrade his word-processing package to Volkswriter from Lifetree Software Inc., Monterey, CA. It took 10 months of beating the bushes to secure a version of the program for the HP-150.

Still, not all micro users need the most advanced software available and are well served by basic spreadsheet, word-processing, and database packages. Such packages are widely available for off-brand micros. For users who need only the basics, limitations on the availability of advanced programs are not a big concern.

For a micro to age gracefully, it must be able to be retrofitted with additional memory, add-on processors, peripherals, and other enhancements. IBM PC users can be fairly confident that new enhancements will be tailor-made for their machines, if not by IBM, by third parties. Users of off-brand micros may not be able to find add-ons that fit into their machines. For instance, micros made by Hewlett-Packard, Data General, and Wang Laboratories Inc. (Lowell, MA) cannot use adapter cards that provide extra memory, enhanced graphics, co-processors, and terminal emulation for IBM PCs. Also, recently announced products that explode random-access memory barriers are designed only for the IBM PC.

More ominous than obsolescence is the possibility that a vendor will discontinue production and support of its micros. In the Newton-Evans survey of MIS/dp managers, 38 percent cited vendor stability as the biggest consideration in choosing non-IBM micros.

Despite the potential for having the rug pulled out from under their micro strategies, some MIS/dp managers who have chosen off-brand micros say obsolescence and vendor failures aren't the big problems they initially seem to

be. "We're concerned about obsolescence," says Doug Wakefield of the Lansing Board of Power and Light, "but in this day and age, I don't see how you can get away from it."

If the microcomputer is doing a useful job, the fact that no more are being made is not perceived as an immediate problem, says Michael Abbene. "At Monsanto, we've already cost-justified our computers on the basis of certain tasks," he says. "We can continue to use them through their normal lifecycles."

"Many managers worry that discontinued equipment is an instant millstone around their necks," says one industry analyst, who adds he advises clients to leave discontinued systems in place. "Once a business has fully depreciated the equipment, it can be shuffled down to the lower echelons or shifted over to someone with relatively simple computer needs," he says.

In general, organizations depreciate micros over short periods, sometimes as quickly as two years. Micros are depreciated rapidly not because the equipment will wear out, but because decision-makers generally want more advanced features of new equipment.

"Micros are like telephone handsets these days," says Lockard of Corning Glass. "You plug them into the wall and they all work. But different models from different vendors have special features that are important in certain circumstances." With a little investigation and exploration, it's possible to leave the IBM fold while staying within the mainstream of microcomputer development. Many businesses that have invested prudently in non-IBM micros have realized significant added value from their off-brand machines without sacrificing or risking very much. □

*Robert A. Moskowitz is a free-lance writer and management consultant based in Woodland Hills, CA.*





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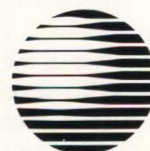
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## DATA SWITCHES



Photo by Bob Ward

# OFFICE NETWORK UPDATE . . .

*. . . on how and where digital PBXs are giving data  
a voice in office communications.*

by Gary Stix, Communications Editor

**W**hen the private branch exchange (PBX) can function as a channel for data as well as voice, it's plausible to ask why the PBX is "the road not taken" for data in so many office-communications networks. Vendors have touted the data-switching abilities of the PBX for years. Yet of the 4.6 million PBX systems shipped last year, more than 95 percent were used for voice-only commu-

nications, according to Kathy Healy, a telecommunications analyst for Northern Business Information, a New York market-research house.

Most PBX buyers are wary of vendors' data-switching claims. Users with heavy data-communications requirements are reluctant to replace existing networks until they ascertain which networking system—PBX, local-area network (LAN), or dedicated network—

will best suit their corporate needs. Yet, while many local-networking products languish in laboratories or brochures, the digital PBX is already in use as a relatively simple way to integrate office machines.

For many users, the PBX is the most practical and immediate means to set up an office-communications network. The PBX transfers both phone calls and data as a digital stream of zeroes



and ones and data messages can usually be sent over the wiring used for phone calls, making every office a potential network station. The PBX also serves as a gateway to the public phone networks; data can be channeled through a modem attached to the PBX—a so-called modem pool—for outside connections.

The PBX's pluses, however, are balanced by data-transfer speeds of 64 kilobytes per second (Kbps) or less that make the PBX unsuitable for transferring large data files or transmitting video. Add-on networking modules that purport to achieve higher transmission rates have been shunned by most users due to product-availability delays and technical problems.

Another factor that causes prospective PBX buyers to hesitate is bugs in PBX operating software. Pilot-testing of some switches ended three years ago, yet program pests persist. These flaws usually prove to be relatively minor, but buyers must carefully evaluate PBX vendors for service responsiveness. On balance, the PBX as a data switch can be judged a success for applications ranging from electronic mail to the sharing of printers and mass storage devices.

Channeling data through a PBX has one significant advantage over other types of office networks. "Once a phone jack is in the office, it doesn't matter where you move employees," says Mike Tedder, manager of communications networks for PPG Industries. PPG, a manufacturing conglomerate with \$4.3 billion in annual sales, must accommodate the high mobility of the office workforce at its Pittsburgh headquarters. "Some employees move once in five years, but others move five times a year," says Tedder. "The costs of moving employees around so much start to add up very quickly."

PPG purchased the IBX system with 2,200 voice-and-data lines from In-

tecom Inc. Through the IBX, secretarial pools, data-entry operators, purchasing staff, and accounting clerks have access to various IBM mainframe and minicomputer systems. The IBX provides PPG with limited savings by eliminating the need for modems. PPG had been spending \$3,250 monthly to lease 15 modems and lines for interoffice communications.

The real savings will come as the number of terminals at PPG increases over the rest of the decade; the IBX's ability—without upgrades—to switch voice and data is expected to serve PPG's expanding needs. Although some other systems were cheaper, PPG was able to justify the IBX purchase by depreciating it over a longer period. "We peg the life of the IBX system at seven to eight years, as opposed to three years for other PBXs we evaluated," says Tedder. In 1983, PPG had tentatively decided to purchase Intecom's IBX pending the release of AT&T Information Systems' System 85 digital PBX. "System 85 didn't have any features to distinguish it from those of AT&T's Dimension Series of PBXs," says Tedder, who adds that price estimates quoted for System 85 were far higher than those for the IBX. "Looking at it over a five-year period, we would have been paying a 50 percent premium for the AT&T product versus the Intecom product," he says. Tedder also considered the IBX's 32-bit master-control unit that significantly speeds switching times, outpacing the 16-bit processors used in competitors' systems.

The digital PBX is an ideal foundation for an electronic-mail network. Because voice and data share the same path, electronic messages can be relayed to every office location. The Delco Electronics division of General Motors, Kokomo, IN, uses the NEAX 2400 Information Management System from NEC Telephones Inc. By

year's end, Delco hopes that 1,500 employees at its headquarters—accounting for one-third of its lines—will be sending electronic messages through the PBX. The NEAX 2400 routes messages to Digital Equipment Corp. (Maynard, MA) and Hewlett-Packard (Palo Alto, CA) host computers, where the messages are stored and retrieved. Messages were previously sent via a Microm Systems (Chatsworth, CA) data switch. And by choosing the NEAX 2400, Paul Fike, Delco's telecommunications manager, has avoided the headache of wrangling with more than one vendor for maintenance.

And wrangle he must. "Quite a bit of set-up is required," says Fike, referring to the complexity of installing the data-switching capability. "There are vital technical specifications for the switch; if any of these are missed—and it's easy to do—the result is a bad connection or none at all." Fike characterizes service from NEC as "slow," though its support staff is better trained than it once was. "The support people know about the system now," he says. "Six months ago, everyone was still learning." Fike says the NEAX 2400 is "very easy to use," once installed.

Delco has installed six NEC systems to replace 45-year-old AT&T electro-mechanical switches. The cost: \$600 per analog line, and \$1,100 to \$1,200 per line for digital connections, each of which includes a Dterm, NEC's 16-button phone handset. The systems provide paybacks for voice communications as well as data communications. A portion of Delco's return on investment is due to the switch's ability to restrict outgoing calls. This significantly reduces the \$200,000 Delco spent annually on personal calls, Fike says.

A digital PBX can provide connections other than electronic mail, such as linking a micro and a mainframe com-

*(Continued on page 70)*





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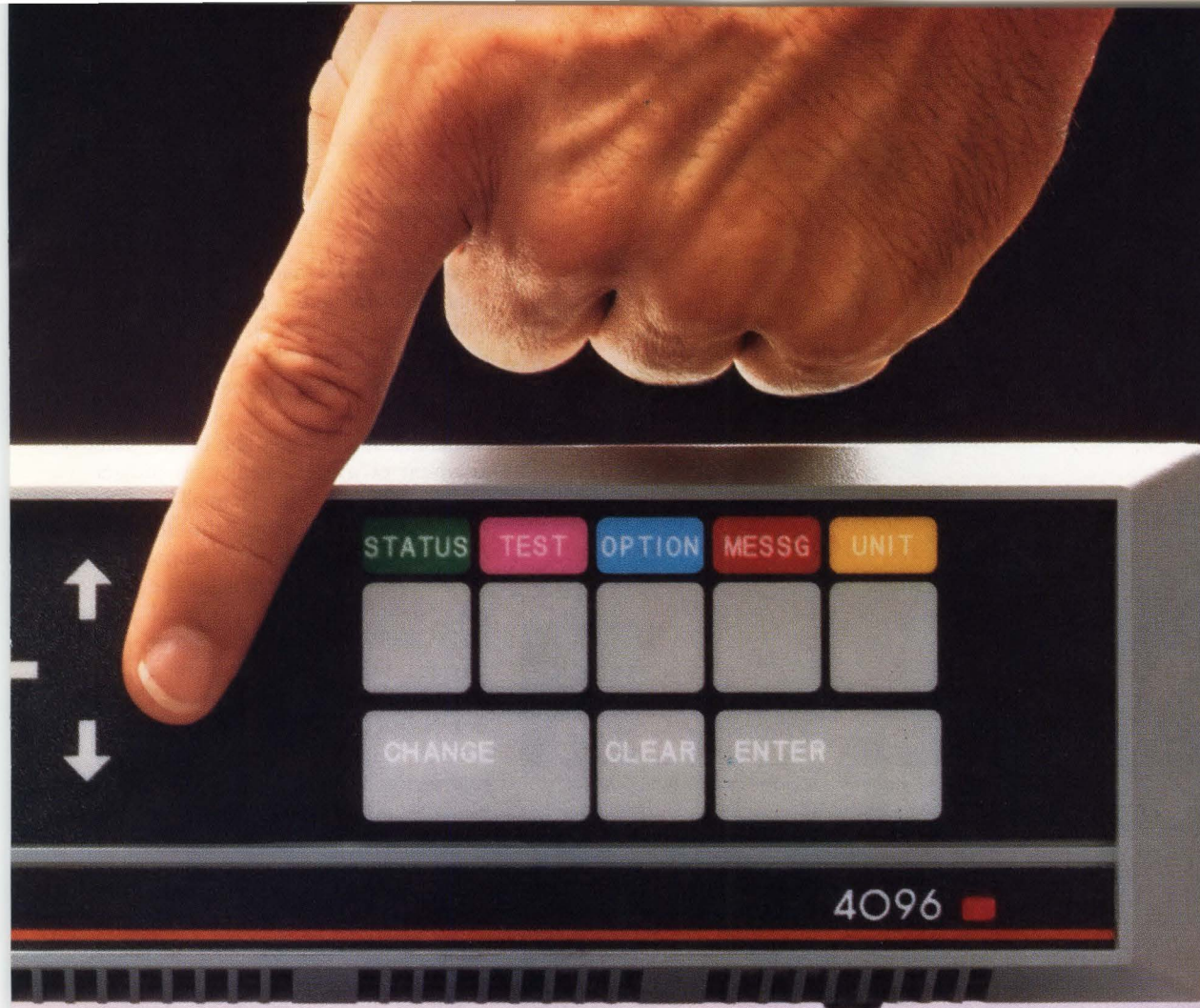
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CIRCLE 28



# DATA SWITCHES



Photo by Ed Lallo

A digital PBX links far-flung micros to the corporate mainframe at Surgikos Inc., Arlington, TX. "Now the salesman in Timbuctoo can send and receive messages," says Mary Smith, telecommunications coordinator.

(Continued from page 67)

puter. Surgikos Inc., an Arlington, TX, surgical-supply subsidiary of Johnson & Johnson, uses Northern Telecom Inc.'s SL-1 system to route requests for financial and sales information from executives' personal computers or a Northern Telecom Displayphone—a combination phone and terminal—to an IBM mainframe. The micro-to-mainframe link will be expanded so that it can be accessed by sales personnel. "The salesman out in Timbuctoo will be able to send orders and receive messages with the SL-1," says Mary Smith, Surgikos' telecommunications coordinator.

The only problem Surgikos has had is a malfunction in the switch's software. The problem sometimes cuts off a connection. After notifying Northern Telecom of the problem, Smith says: "I was told that I couldn't be helped right now."

Another SL-1 user is brokerage house Prudential-Bache Securities Inc., which chose the system for its new headquarters in the Wall Street area of Manhattan. Personal-computer users use the SL-1's data-switching capability to develop their own software applications. "We can't provide enough programmers to satisfy the appetites of all our users," says William T. Rush Jr., Prudential-Bache's senior vice president for corporate communications. About 500 employees use off-the-shelf

microcomputer software to create applications, such as departmental databases. Selected information from the corporate mainframe, located several blocks away, can be channeled via fiberoptic link to the headquarters building, where the SL-1 routes the data to a user's desk.

Sending data over a PBX network, Rush believes, is an ideal approach to finding out which users are the most demanding. "This is the cheapest way to test what our users really require," Rush says. "The SL-1 allows us to interpret communications-traffic flows and which user groups exceed the capacity of the SL-1." Additional high-speed networks—Northern Telecom's add-on Meridian module, for example—may be considered if needed. The SL-1 has proven itself, though Rush says Northern Telecom has been slow in upgrading a problem-plagued feature of the PBX's software that automatically distributes incoming calls within a group of employees.

The purchasing power of a large user often counts for little when setting up a PBX system. The larger corporations are often early purchasers and the vendor or distributor may have had little time to train support personnel, who generally get their real education by servicing the initial installations. Take the case of the \$50 million McDonnell Douglas Corp. (MDC) Telecommunications System project. The St. Louis-

based aerospace manufacturer is in the final stages of the project aimed at eliminating its reliance on Centrex, the switching system that routes calls through the local phone company's central office.

Service is the weak link in the management of a PBX-installation project of this magnitude. McDonnell Douglas contracted with Contel, the Atlanta-based independent phone company, to act as service coordinator for the project. Relations between Contel and McDonnell Douglas are much improved over what they were at the project's midstream a year ago. But Bob Heinze, St. Louis manager for the project, supplied a less-than-glowing reference. "I'm not happy with them," he says, also acknowledging that any other vendor might have experienced comparable difficulties. "We were one of the first to undertake a project like this, and I don't think any telephone company understands the magnitude of the job."

MDC Telecommunications System serves 50,000 McDonnell Douglas employees. It includes three Northern Telecom SL-100s, ranging from 5,000 lines to 27,000 lines, and seven SL-1s with from 150 lines to 2,500 lines. The network also has two T-1 high-speed voice-and-data lines connecting the St. Louis and Long Beach, CA, offices. Private microwave networks in southern California and the St. Louis area are also part of the network. Return on investment is expected to come from Centrex service-costs savings of \$1 million a month for the St. Louis operations alone. The estimated 10-year lifespan of the system holds the promise of providing savings of between \$100 million and \$200 million.

About 2,000 of the PBX lines are used to switch data, mostly for low-speed—300 baud or 1,200 baud—applications. Most connections are analog: A modem is used to communicate between the computer and the PBXs and between the PBXs and a Hewlett-Packard 3000 mini or DEC VAX/780-series minis containing scientific and engineering databases. The SL-series PBXs are generally well suited for large systems, says Heinze. On the data side, the only problem is a software malfunc-



# DATA SWITCHES

tion in the connections between the PBX and the minicomputer: After a user finishes a call, the connection between the PBX and the computer's communications processor often fails to disengage.

Like McDonnell Douglas, many corporations plan to form private telecommunications networks of far-flung offices using PBXs linked by leased communication lines. Data switching via PBX will be one part of a nationwide network being built by Arthur Young & Co., New York. The Big Eight accounting firm has installed five System 75 PBXs from AT&T and has 15 more on order. Each 200-line System 75 unit is a communications hub for Arthur Young's branch offices, where staffing ranges from 85 employees to 200 employees. Data applications currently account for less than five percent of the traffic. But Arthur Young, which is also a telecommunications consultancy, plans to build a database at its home office that will contain current tax and accounting rules. This will enable accountants to conduct research from any branch office. Database queries from the field will be sent from a personal computer or terminal through a System 75, and then be picked up by a bigger AT&T switch, the System 85, at the home office.

The AT&T System 75 has established a reputation as a top-flight voice switch, but it hasn't always been the first choice of telecommunications managers seeking out a PBX for heavy data applications. The relatively limited number of circuits available on the System 75 could tax its capacity.

For Arthur Young, the System 75 is still attractive as a data switch. With fewer than 150 employees per branch office, there is little likelihood that the switch's limit of 246 simultaneous voice or data transmissions will be strained. When corporate management decided to connect home and branch offices using PBXs and private leased lines—a nationwide "electronic tandem" network—only AT&T and Northern Telecom had the equipment and personnel to pull it off, says Bruce Nolin, Arthur Young's director of information management. AT&T won out. "AT&T had 200 tandem networks installed and

Northern Telecom only had a minute fraction of that number," he says.

Switch capacity is a prime PBX-planning consideration, as data needs often grow faster than expected. When Texaco Corp., White Plains, NY, first installed Rolm Corp.'s CBX switches, it projected that the 500-odd lines made available to its Denver office would provide enough capacity for five years. Texaco's petroleum engineers call up engineering-analyses data stored on minicomputers accessed at speeds of 9.6 Kbps through the CBX. Complacent that Denver had an adequate network for years to come, Dan Howell, Texaco's project manager for telecommunications, was shaken when, 18 months after installation, he heard the news from Denver. "Everybody told me the system was so great that the office had decided to buy a whole bunch of new computers, and switch capacity would have to be upgraded." The cost of the system upgrade equaled that of the original installation, an expenditure that could have been avoided if the full 1,000-line capacity had been installed at the outset.

The CBX generally meets Rolm's claims for it, but installation occasionally became what Howell describes as a "bumpy road." Initially, the CBX's operating-system software contained bugs that hampered the CBX's ability to transfer voice and data between different processing units. But Rolm worked with Texaco on this problem. "Rolm backed us up all the way, and

there was no charge for the service," Howell says.

While a large user like Texaco needs to find ways to cope with increasing demand for data communications, smaller users may have a hard time finding a vendor to service their limited needs. Five employees of First Interstate Capital, a venture-capital subsidiary of Los Angeles-based First Interstate Bank, decided to go it on their own in 1983 and became Interven Partners. When it came time to choose an office-communications system with data-switching capabilities, the decision proved to be an easy one: There were few all-digital systems that could be used with a dozen lines or less.

Interven Partners, which still manages a \$42 million venture-capital pool for First Interstate Bank in addition to other venture-capital funds, installed the Telenova 1 Integrated Communications Network from Telenova Inc. to serve its nine employees. The PBX switches 12 lines, although it can handle 10 times that capacity. The partners have used the system for more than a year to send information from desk to desk. "You can transfer a screen of data to someone in another office while holding a phone conversation with that person," says Keith Larson, Interven's chief financial officer. The system also allows Interven's nine employees to share the use of a Hewlett-Packard Laserjet printer and an Epson America Inc. (Torrance, CA) FX-80 dot-matrix printer. Two modems provide access to outside phone lines for communications with the electronic-mail system at First Interstate Bank's headquarters and online-information services, such as Dow-Jones News Retrieval, New York.

The Telenova 1, which cost Interven about \$40,000, was chosen over an LAN and a voice-only PBX. "The costs were about the same," says Larson. "But because the Telenova transmits voice and data, we didn't have to hire somebody to integrate separate systems, and we didn't have to add extra cabling as we might have for an LAN; we use the existing phone wiring for the Telenova 1." Interven is one of the first users of the system. "In the beginning

(Continued on page 81)



Bob Heinze, St. Louis manager for McDonnell Douglas Corp.'s \$50 million PBX project says, "I don't think any telephone company understands the magnitude of the job."

Photo by T. Mike Fletcher



# MIS/DP THINKS SMALL

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*Distributed data-entry systems  
are gaining in popularity  
as their benefits become  
more apparent.*

by F. Lisa Beebe

**W**hen it comes to data-entry operations in MIS/dp, smaller keeps getting bigger. As more and more businesses opt for decentralized, distributed data entry, the number of large, centralized data-entry departments in MIS/dp continues to drop. Consultant Lawrence Fiedelman of Management Information Corp., Cherry Hill, NJ, claims the number of centralized data-entry operations has declined by 50 percent to 60 percent since 1980. The Diebold Group Inc., a New York-based consultancy, says the proportion of MIS/dp staffers devoted full-time to data entry dropped from 22 percent in 1977 to 7 percent in 1984.

Distributed data entry offers advantages over centralized operations that few corporations can ignore. In centralized operations, data capture, entry, and processing are three separate functions. In distributed systems, data capture and entry are merged. Eliminating the dedicated data-entry function can not only save time and money, it can also reduce the number of errors introduced by data-entry operators.

"Originally, data entry meant gathering paper for a key-punch group," says W.F. Weprin, manager of information systems at People's Gas, Light and Coke Co., Chicago. "But the best way to enter data is to go back to where the paper





Photo by Bob Ward

is filled out and have that person enter the information at a terminal."

People's Gas, which fields thousands of customer-service phone calls each day, installed a distributed data-entry system in 1973. Customer-service personnel use terminals to key in such data as changes of address, reports of billing errors as they come in. According to Weprin, distributed data entry has allowed People's Gas to reduce its key-punch staff by about 75 percent. Meanwhile, notes Weprin, data accuracy has increased, not only because data entry has been streamlined but also because checks and balances programmed into the system allow online validity checking before data are sent to the mainframe.

Distributed data entry also offers a solution to MIS/dp's "sweatshop syndrome." MIS/dp has been haunted by the stark image of the data-entry sweatshop, with countless operators slavishly pounding away at keyboards. "Being a data-entry operator in a centralized setup isn't easy," says Norman Bodek, president of the Data Entry Management Association, Greenwich, CT. "There's a lot of pressure involved in working at a terminal all day." In a decentralized system, Bodek notes, data-entry functions are integrated with other activities, making data entry much less exacting.

In addition, distributed systems help to eliminate the "us against them" attitude so often found in MIS/dp and user departments. Responsibility for the actual preparation of the data rests with the user department. With errors presumably caught and corrected at the source, interdepartmental disputes over faulty data are minimized. MIS/dp managers no longer need to use their budgets to pay for user-department input.

A number of vendors offer ready-made distributed data-entry systems. The Total Entry System from Interface Technology, St. Louis, runs on the IBM Series/1 minicomputer and can be used for order entry, payroll reporting, and sales reporting. The Total Entry System can also function as a voice-response system. TSI International's



# DATA ENTRY



Photo by Rick Wood

Distributing data entry helps dramatically reduce the time needed to process orders, says Vollrath Co.'s Richard Bader.

(Wilton, CT) Key/Master is an online data-entry system that runs on IBM 370, 30XX, and 43XX mainframes. Ode II from International Software Technology (Monroe, WI), which runs on IBM mainframes under OS or DOS, incorporates a programming language.

The promise held by distributed data entry has stirred the creative juices in a number of dp shops. The information-services division of Vollrath Co., a Sheboygan, WI-based manufacturer of stainless-steel products and walk-in refrigeration units, has developed its own data-entry system, called the Informa-

tion Communications Online Network (Icon). The Icon order-entry system covers more than 50 of Vollrath's distributors nationwide. Vollrath leases and installs terminals at distributor and customer locations. The terminals are linked via the telephone lines with Vollrath's central IBM 3083 mainframe; users can access Vollrath's inventory and production schedules and place immediate or pending orders depending on stock availability.

Before it installed its in-house system, Vollrath had used overnight batch data entry. With Icon, Vollrath has cut its order-processing time from one day to several minutes, says Richard Bader, president of the information-services division. "We have gained credibility with our customers," Bader says. "With Icon, when an order is entered we can tell customers which products are on back order and when they're expected to be available. Before, we could only guess if the product would be shipped the next day."

Vollrath also uses Icon for market forecasting, raw-materials ordering, production scheduling, and inventory control. Bader says Icon has helped Vollrath reduce the value of its inventory by \$5 million. Vollrath has reduced its production lead times by up to 50 percent, its steel inventory by 75 percent, its production staff by 30 percent, and its back orders by 40 percent, he adds. At the same time, Bader says,

Vollrath has increased overall sales to its Icon-linked distributors by 25 percent to 40 percent.

United Services Automobile Association, a large insurance carrier based in San Antonio, TX, uses a voice-response order-entry system to handle customer requests and inquiries over the telephone. Customers with Touch-Tone phones can use the push-buttons to enter information into United Services' IBM Series/1 minicomputer. Information is then sent back to the customer through a voice synthesizer.

Ron Kuznicki, manager of research and development at United Services, says that although batch entry of mail-response cards is more cost-effective than the voice-response system, voice response offers significant improvements in customer service. "The service is available 24 hours a day," Kuznicki says. "Also, we cut response time tremendously by eliminating the intermediate step of mailing in a response card." Kuznicki adds that the voice-response system frees customer-service personnel to handle more challenging and creative work.

Recently, the availability of more sophisticated software has allowed MIS/dp to use office microcomputers for distributed data entry. The distributed data-entry system operated by T. Eaton Co. Ltd., a Toronto-based retailer, consists of personal computers located in each of the corporation's 100 retail stores. The remote-site micros run S1DES/PC, a microcomputer version of the Series/1 Data Entry System software from Software Consulting Service, Bethlehem, PA. Store employees enter data with S1DES/PC; at the end of each day, data are downloaded from the micros to Eaton's IBM Series/1 minicomputers. Previously, each store sent daily sales data via mail to a central site for entry into the system.

Some recent advances in technology promise to boost productivity of both centralized and distributed data-entry systems. Optical-character recognition (OCR) data-entry techniques, which have been around almost as long as keypunching, finally seem to be gaining acceptance in dp shops. In the past, MIS/dp managers placed little confidence in OCR systems because the

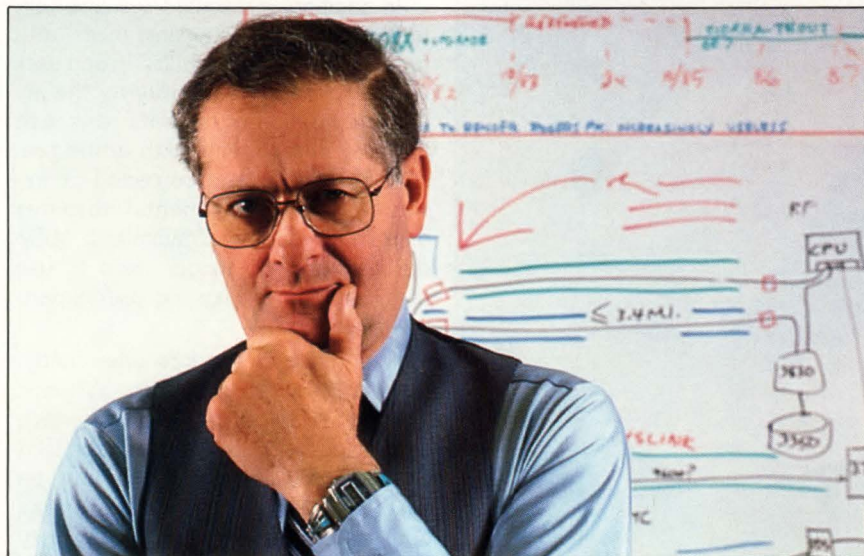


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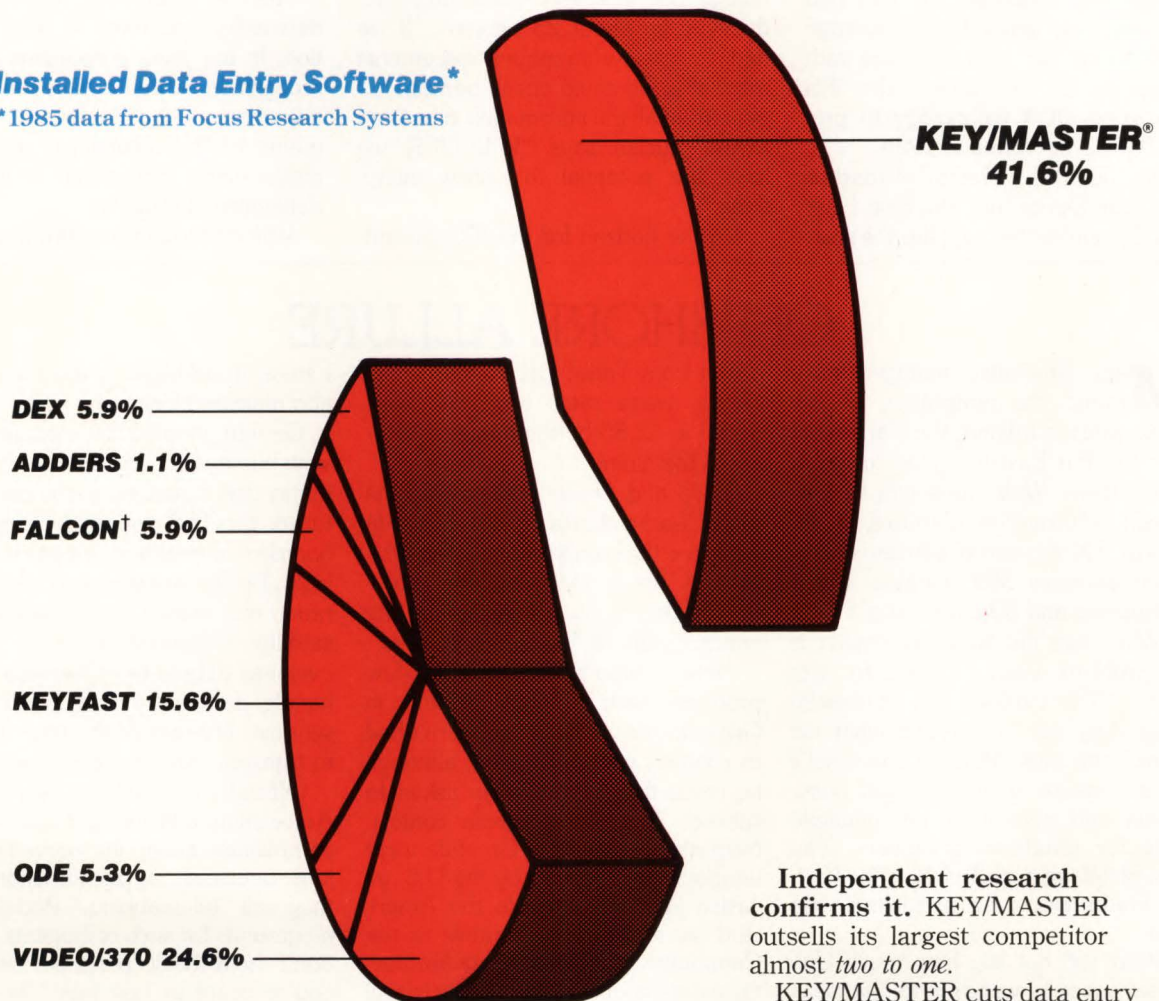
W.F. Weprin, manager of information systems at People's Gas, Light and Coke Co., Chicago, says distributed data entry has allowed the utility to cut staff and increase accuracy.



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systems were prone to make high numbers of errors. However, OCR systems got a big boost when the Internal Revenue Service successfully began to use the technology to process income-tax returns.

The IRS first began using OCR technology in 1983 to process federal-tax deposit forms. Each OCR machine delivered fully processed forms at an average rate of 8,000 per hour; the manual keypunch machines the IRS had been using only generated an average of 129 forms per hour. Pleased with the success of the system, the IRS began using OCR technology to process 1040EZ tax forms in 1984.

Bruce Johnson, director of marketing at Scan-Optics Inc., the East Hartford, CT, vendor that supplies the scan-

ning system the IRS uses for the 1040EZ forms, says the IRS processed about 8 million 1040EZ returns in 1984 using OCR machines. The IRS reports an error rate of 1.5 percent using OCR equipment; manual keypunch processing yields an average error rate of 6 percent to 7 percent.

According to Joanne Luciani, public-affairs officer at the IRS service center in Brookhaven, NY, use of OCR technology has increased data-entry productivity by about 25 percent. "If we had to review taxpayer documents manually, we could check perhaps 10 percent of all the information submitted to us," Luciani says. "With OCR, we have the potential to review everything."

On the horizon for the IRS, accord-

ing to computer specialist Steve Riedl, is a system that will deliver both a digital and optical disk from a single machine, combining OCR and image-processing technology to display both data and image on one screen. "We'd never have to pick up paper again," explains Riedl. "Instead of having to store half a billion additional pieces of paper each year, we'd store the information on optical disks."

Another promising technology for data-entry operations is voice recognition. In the past, proponents of voice-recognition systems have been more talk than action. But recent developments in the technology may finally make voice recognition a legitimate data-entry alternative.

Voice-recognition data-entry sys-

## OFFSHORE ALLURE

**M**any data-entry managers have found the temptation of low wage rates in Ireland, the Caribbean, and the Far East too good to resist, says Donna Walz, president of Universal Information Capture, a Ft. Worth, TX, data-entry concern. Walz' outfit employs 300 workers in the Philippines and 300 in Peking.

Walz says the language barrier is no problem when it comes to data entry. "The workers key in exactly what they see, and that's what we want," she says. Much of Universal's work consists of putting legal documents and periodicals on magnetic tape for database producers. The cost of keying in such data in the United States would be prohibitive, she says.

Walz will not say how much Universal saves in wages in its overseas operations. But Walter Nelson, whose Analysis and Programming Corp. (Stamford, CT) runs data-entry operations on the Caribbean islands of St. Kitts and Grenada, says he pays overseas workers about \$2 an hour, compared with the \$6 or more an hour data-entry clerks get in the United States. Lower Caribbean wage rates also attracted American Airlines, Dallas, which saved \$3.5 million in the first year it moved its data-entry oper-

ations from Tulsa, OK, to Barbados. Hourly wage rates were cut from \$6.50 to \$2.50 by the move, according to the airline.

Walz and Nelson agree that the main disadvantages of overseas data entry are the comparatively long turnaround times required per job—usually two to four weeks—and the impracticality of handling small jobs.

Nelson reports he has had few problems with the governments in Grenada and St. Kitts, and hasn't had to contend with corruption, although he notes that he has been asked to sponsor the Miss Grenada contest. Nelson's operations in Grenada were temporarily disrupted by the U.S. invasion in 1983 because the Americans were not as cooperative as the Communist government in guaranteeing a dependable supply of electricity, says Nelson. The installation of two new generators has since allowed him to resume operations.

The movement of data-entry operations offshore began two decades ago, when several corporations established operations in Ireland, says Norman Bodek, president of the Data Entry Management Association, a Stamford, CT, trade group. Now, offshore data entry has spread to Korea, Singapore, Taiwan, India, and Sri

Lanka, in addition to the Caribbean and mainland China, he says.

Growth in offshore operations is slow but steady, says Bodek. He estimates that 1 percent of the data captured for U.S. operations is key-boarded in overseas shops. Interestingly, Bodek knows of no U.S. corporation that makes use of facsimile or satellite communications to speed overseas data entry. Overseas shops handle data entry that is not time-sensitive because of the time needed to transport records, Bodek says.

Officials of Local 925, the National Association of Working Women, have complained about the movement of jobs overseas, a phenomenon that they call "telescabbing." Bodek sees no grounds for such complaints. "You don't hold back progress because you're going to lose jobs," he says. "You keep being more creative in what you're doing and you'll find lots of jobs."

"Executives get blocked," Bodek continues. "They think, 'I can't work in a foreign country.' But once you cross the barrier, you see it can be done easily," he says.

—Paul Raeburn

*Paul Raeburn is science editor for the Associated Press.*



tems are most appropriate for situations in which personnel cannot easily use keyboards to enter data, such as in warehouse and quality-control operations. Until recently, the biggest drawback to voice data-entry systems was the need for users to insert distinct pauses between words and phrases. But Verbex, Bedford, MA, has released a line of products that can process continuous speech.

Verbex's Model 3000 system is currently used by General Electric Co. in its main distribution warehouse in New Concord, OH. The system has been in place for about one year and is used to enter data from freight bills and packing lists as materials are received in the warehouse. The system is hooked up to an IBM Personal Computer, which provides on-screen prompts for workers during input. The data are instantaneously transmitted via phone lines to a mainframe in Louisville, KY. In a matter of seconds, items received at the warehouse are checked against original purchase orders.

As data entry continues to move away from centralized dp shops to user departments, the roles and responsibilities of MIS/dp managers are changing. "MIS/dp managers used to just have to worry about dp activities," says Lawrence Fiedelman. "Now, they have to have a working knowledge of what's going on in the user departments. In most cases, users will still look to MIS/dp to make the big decisions."

Even though a data-entry system may be distributed, a need still exists for a central, controlling responsibility. MIS/dp managers must provide user departments with the power, equipment, and technical support they need to ensure proper functioning of the system. Because of this, managers must become increasingly involved in long-range strategic planning, policy setting, and coordination.

W.F. Weprin at People's Gas has seen his job responsibilities expand tremendously with distributed data entry. "When we were on batch systems, I was responsible for billing, accounts re-

ceivable, meters read, bills rendered, and payments received by accounting," he says. "Today, my responsibilities include all that and just about everything else involved in providing services to customers, including operations, repair work, payroll maintenance, labor distribution, accounts payable, and dealings with stockholders. Dp is now involved in all aspects of the company."

St. Charles, IL-based consultant T.J. Springer sees the growth of distributed data entry as a blessing for MIS/dp managers. Springer says that MIS/dp management positions will be more creatively oriented because managers will be less involved in the day-to-day maintenance of user files. "Decentralized systems will give managers an opportunity to redefine their roles within organizations," Springer says. "Their empires may not be as big, but they'll be more influential." □

*F. Lisa Beebe is a free-lance writer based in New York.*

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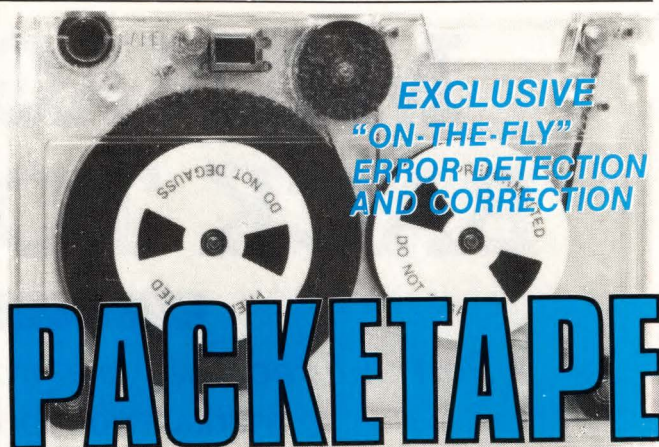
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H I G H E R E D



Photo by Allen Zentreich

# MANAGERS GO BACK TO SCHOOL

*Part II: Executives are graduating with honors from managerial computer courses.*

by Jennifer E. Beaver, Office Automation Editor

**T**he toughest training challenges in the office are all the bosses who suddenly must know about automated systems. Computer literacy has become as important to their success as having insight into the competition's latest moves. Giving such training to them is not easy.

Many managers and executives know all about how to work with computers: They ask MIS/dp for an appli-

cation or delegate tasks to subordinates. What's needed—particularly for middle managers—is an understanding of what office systems can do, not just hands-on training. But when training managers to send electronic messages or build spreadsheets, organizations often miss an important point: Better understanding of system capabilities will contribute to time- and money-saving innovations and, ultimately,

higher productivity and effectiveness.

Effective managerial training encourages the "students" to think about how to apply computers without binding them to their machines. When a manager builds spreadsheets, for example, he or she should be encouraged to study the process and its possible application to a broad spectrum of jobs. "Suddenly, managers have the knowledge to ask questions they've never



asked before," says James Freeland, a professor of operations management at the Colgate Darden Graduate School of Business at the University of Virginia (Charlottesville).

"Part of my job is to increase the long-term productivity of my employees," says Robert Puette, general manager of the internal office-automation division at Hewlett-Packard Co., Palo Alto, CA. "Really learning what a personal computer can do is critically important to increasing your staff's effectiveness." The fact that he uses a micro in his office is not important, says Puette. His knowledge of its potential is, however.

Zeroing in on how a system or software package can improve departmental effectiveness requires a big time commitment. A quick course often just won't do. Before recommending software to her 10-member staff, a financial officer at a New York bank first uses disk-based tutorials, then reads up on the product, and only then takes outside training courses. Although her bank has a training department, this executive believes the in-house courses are not directly related to her department.

Four types of training courses are used to acquaint managers and executives with the latest office systems. The most popular is the computer-literacy course, which provides an overview of an office system's capabilities. The second type, task competency, is sometimes merged with literacy courses. Strategic planning for information systems—"courses" that are often offered by large vendors like IBM and AT&T to their customers—is the only kind of instruction for which hands-on training is not always essential. In computer simulation, managers are trained by programs that present everyday problems.

Computer-literacy courses for managers often cover the capabilities of

popular business-software programs, such as 1-2-3 and Symphony from Lotus Development Corp., Cambridge, MA, and dBase III and Framework from Ashton-Tate, Culver City, CA. These courses familiarize managers with tasks that can be performed by subordinates rather than train managers to use the programs themselves.

Although literacy courses generally stick to the basics, they can be very beneficial. Nancy Ciano at Applied Computer Consultants (ACC), Oakland, CA, believes the manager's understanding of the complexities of various computer tasks and the amount of time it takes to accomplish each one is crucial to implementing automated office systems. ACC's executive overview course touches on word processing, spreadsheet use, database management, communications, and operating systems. The course acquaints executives with the realities of office automation so they will make realistic demands of their subordinates. "We often get managers who believe their subordinates simply push a button and a report pops out," says Ciano.

Correcting these misconceptions may also help managers take a more realistic view of their organizations' training needs. Until they've dabbled at the keyboard themselves, managers and executives may not realize how important training is for others. In a survey by International Data Corp. (IDC), Framingham, MA, 29 vendors of diskette-based tutorials and audio-visual training aids reported that 61 percent of their customers don't offer their employees any personal-computer training. But the survey also indicates expenditures for training software and services for all levels are on the rise.

It follows that managers who learn how to operate office systems will be better able to identify lazy or incompetent employees. At a seminar by Computers Simplified, Oakland, CA, a bank

executive chuckled when William Gallagher, the training director, performed a particular task on 1-2-3 in five minutes. The executive explained that when he'd recently asked a subordinate to do the same task, the employee told him it would take about four days.

Costs for computer-literacy courses vary, depending on class and size, material covered, and location. PC Executive Training Center, a New York outfit, offers a single-day briefing for officers and management for \$1,100. An on-site session costs \$1,000. PC Executive recommends limiting the class size to 12, with every two students sharing a personal computer. ACC charges between \$70 and \$100 per student for a four-hour on-site class on 1-2-3, Symphony, and dBase II and III, depending on how far the instructor must travel. ACC also offers four-class series on Symphony and dBase II and III.

In general, computer-literacy courses are not technical. They focus on the functions systems and software perform, rather than on the way they perform them. Technical courses do have merit, however. Some managers, particularly those with technical backgrounds, like to move from the general to the specific when studying office systems. After learning the general outlines of a system's performance, they want to probe further—into the guts of the system or software. Many vendors offer this training, and most independent training vendors have "advanced" versions of general courses. For example, PC Executive Training Center offers advanced instruction courses in Lotus' 1-2-3 and Symphony, and Ashton-Tate's Framework. Prices are \$125 and \$150.

A computer-literacy course does not have to be time-consuming to be beneficial. Instead of showing students a variety of ways to accomplish the same task, many instructors concentrate on only one way to do a job. They also emphasize that learning is not necessarily mem-



orization. "Our students aren't being trained to pass some kind of test," says Jay Sedlik, president of National Training Systems Inc. (NTS), a Sherman Oaks, CA, publisher of training books for popular business software. NTS gives students checklists that serve as refresher courses so they can maintain their proficiency long after the course is over. In a step-by-step style, these performance aids summarize every task that NTS teaches. This reduces the pressure on students to remember every computer command.

Middle managers are the best candidates for computer-literacy training because of the hands-on nature of their jobs. At Oppenheimer Development Corp., Boise, ID, for example, managers rely on computers for decision-making capabilities. There simply aren't many staffers to delegate tasks at Oppenheimer, a corporation with a small staff and high revenues. Roger Cantlon, president of the real-estate developer and international food brokerage, uses an IBM Personal Computer for accessing outside databases and using spreadsheets. The financial manager uses a personal computer to prepare sales graphs, charts, and annual forecasts.

Courses on the strategic planning of information systems take managers a big step beyond competence by focusing on the strategic implications of office systems. In the Executive Computer Concepts course offered by Computers Simplified, managers study information-resource management and OA planning. "Executives often see an OA system demonstrated or hear about it secondhand, and then decide they must have that wonderful new product immediately," says William Gallagher. "We tell our students to take it slow and to alert their employees at least a month before making a purchase so they'll have time to prepare for the change."

At Callaway Gardens, a resort in the Georgia foothills of the Appalachian Mountains, AT&T offers the executives of selected customers a two-and-a-half-day brainstorming session on information-resource management. Called "Strategic Management for Information Systems: An Executive Program," the course is aimed at policy-level executives of large corporations. The course is



Photo by James Mason

Nancy Ciano at Applied Computer Consultants says managers' computer literacy is crucial to the implementation of OA systems.

geared toward strategic and managerial topics, rather than technical ones. "We teach our students how to control, organize, and improve the quality of information flow so they can gain a competitive edge," says Roger DuCharm, director of customer management education. The seminar is free to invited guests.

Computer simulations are one of the newest management-training methods. By using computers to make speedy forecasts and examine scenarios, these programs encourage managers to examine assorted strategies before making decisions. Planning & Control Inc. (PCI), New York, offers training programs tailored to manufacturing, sales, project and operations managers, and executive decision-makers. For example, the project-manager program covers budgets and contractors; the sales-manager program covers sales accounts and commission structures. All the programs share a common goal: to prepare managers to plan, control, maneuver, and make decisions with limited resources.

General Electric's managers consistently rate the PCI courses above other types of training, according to Richard Slivka, a consultant in GE's technical-education site in Bridgeport, CT. "Students can apply what they learn in these courses to their daily tasks," says Slivka. "They learn to take calculated risks without inadvertently sabotaging projects." Students work in teams to solve

problems, promoting cooperation between managers. Each of the four courses PCI offers costs between \$400 and \$530 per student. A course can be customized for an additional fee.

No matter which training method a course employs, managers and executives benefit most from live instruction, according to IDC's survey. Live instruction makes for more efficient use of time. Instead of spending frustrating hours alone with a keyboard, most executives prefer to have an instructor answer questions and teach them shortcuts.

Many corporations, particularly those with well-established training programs, assign staff instructors to as many courses as possible. Bringing in a third party to teach a course can be expensive. However, in many instances, training of managers and executives should not be done by staff trainers. Managers and executives often resent being placed in a "subordinate" position to an employee. "Our managers believe outside trainers are more proficient than in-house instructors, even though that's not always the case," says John Wilhelm, manager of technical training at Bankers' Trust, New York.

Bringing in MIS/dp to handle managerial training can also be risky. When it comes to training, the MIS/dp department has the technical expertise to acquaint managers with office systems, but it may lack the tutorial skills. Managers need a certain amount of hand-holding. Many still view the keyboard as the secretary's tool. For example, at a Computers Simplified seminar, two executives from a major investment firm brought their secretaries to do their keyboarding for them. In a delicate situation such as this, an outside educator may be more successful with executives than a staff instructor.

The issue of who should instruct managers and executives is so touchy that many corporations rely on managers who have completed training to work with their peers.

In the future, office systems and personal computers will become a significant presence in the executive's office. To maintain a strong, insightful leadership and increase their value to their organizations, managers with foresight will expand their computer knowledge. □



# DATA SWITCHES

(Continued from page 71)

there were a few glitches in the software. But now it's really solid and requires virtually no attention." Larson manages the system himself, though he has no background in telecommunications. "I'm a CPA," he says.

The future of the digital PBX in corporate data networks remains uncertain. Despite its data-channeling abilities, the constraints it imposes on data-intensive applications loom large in prospective buyers' minds. Northern Business Information's Kathy Healy be-

lieves the development of the Integrated Services Digital Network (ISDN) could offset the PBX's technical limitations. ISDN, a joint undertaking of international standards groups and telecommunications vendors, has set the ambitious goal of establishing fully digital public phone networks. Voice, video, and data transmissions could be sent as a stream of digital pulses over local and long-distance phone lines if the ISDN becomes a reality. It would spur managers to make their corporations' internal networks digital exten-

sions of the public networks.

Strongly in favor of the digital PBX's acceptance is the absence of an alternative technology. Managers charged with establishing centralized office networks have had their patience tried by vendors' difficulties in delivering viable products. IBM's plodding pace in releasing its office LAN is one example. While more sophisticated network solutions remain mere promises, digital PBXs are ready to provide solutions to the dilemma of creating office-communications networks. □

## PBX VENDORS

| Vendor/Product                                                                | Lines <sup>1</sup> | Price <sup>2</sup>                    | Vendor/Product                                              | Lines <sup>1</sup> | Price <sup>2</sup>                      |
|-------------------------------------------------------------------------------|--------------------|---------------------------------------|-------------------------------------------------------------|--------------------|-----------------------------------------|
| Anderson Jacobson/<br>IOX<br>(408) 263-8520                                   | 250 to 64,000      | \$800<br><b>Circle 400</b>            | IPC Communications/DPX III<br>(203) 622-0656                | 20 to 800          | \$600 to \$800<br><b>Circle 413</b>     |
| AT&T/System 75<br>(201) 898-3278                                              | 40 to 800          | \$397 to \$927                        | ITT/System 3100<br>(919) 878-9510                           | 20 to 288          | \$750<br><b>Circle 414</b>              |
| System 85                                                                     | 1,000 to 32,000    | \$406 to \$1,034                      | Jistel/Jistel 500<br>(203) 375-7154                         | 120 to 640         | \$600 to \$1,000<br><b>Circle 415</b>   |
| Dimension 2000/Custom                                                         | 700                | \$418                                 | Mitel/SX-2000<br>(305) 994-8500                             | 200 to 10,000      | \$500 to \$800<br><b>Circle 416</b>     |
| Dimension 600                                                                 | 275                | \$678                                 | NEC Telephones/NEAX<br>2400-IMS<br>(516) 753-7000           | 100 to 23,184      | \$600 to \$1,100<br><b>Circle 417</b>   |
| Dimension 600 SN                                                              | 275                | \$827                                 | Northern Telecom/Meridian<br>SL-1<br>(214) 437-8000         | 30 to 5,000        | \$750 to \$5,000                        |
| Dimension 400                                                                 | 236                | \$428                                 | Meridian SL-100                                             | 5,000 to 30,000    | \$750 to \$5,000<br><b>Circle 418</b>   |
| Prelude                                                                       | 244                | \$596<br><b>Circle 401</b>            | Panasonic/DX-T616<br>(201) 348-7000                         | 6 to 100           | \$1,295 to \$1,495<br><b>Circle 419</b> |
| CXC/Rose<br>(714) 660-1801                                                    | 80 to 6,000        | \$800 to \$1,200<br><b>Circle 402</b> | Rolm/CBX series<br>(408) 986-1000                           | 40 to 10,000       | \$1,100 to \$1,400<br><b>Circle 420</b> |
| Cyber Digital/MSX<br>(516) 567-2900                                           | 50 to 20,000       | \$400 to \$1,000<br><b>Circle 403</b> | Siemens/Saturn II<br>(305) 994-8100                         | 60 to 150          | \$600 to \$1,100                        |
| DTI/System 585<br>(312) 620-1170                                              | 25 to 2,300        | \$500 to \$1,100<br><b>Circle 404</b> | Saturn III                                                  | 150 to 800         | \$600 to \$1,100<br><b>Circle 421</b>   |
| Ericsson/MD110<br>(714) 895-3962                                              | 100 to 10,000      | \$950<br><b>Circle 405</b>            | Solid State Syst./Jr. Exec<br>(404) 952-2414                | 15 to 246          | \$140 to \$600<br><b>Circle 422</b>     |
| F-Tec/F-Tec 35<br>(201) 562-1100                                              | 2 to 30            | \$400<br><b>Circle 406</b>            | Stromberg-Carlson/Progress<br>CDSS series<br>(305) 849-3000 | 64 to 240          | \$200 to \$300<br><b>Circle 423</b>     |
| Fujitsu Business Communications<br>(American Telecom)/Focus<br>(714) 630-7721 | 8 to 2,000         | \$400 to \$700<br><b>Circle 407</b>   | Tadiran/Coral series<br>(813) 541-5724                      | 8 to 2,500         | \$400 to \$1,300<br><b>Circle 424</b>   |
| GTE Communication Syst./<br>Omni series<br>(800) 272-7469                     | 30 to 2,048        | \$550 to \$1,200<br><b>Circle 408</b> | Telenova/Telenova 1<br>(408) 395-2260                       | 10 to 120          | \$600 to \$1,000<br><b>Circle 425</b>   |
| Harris Digital Telephone Syst./<br>400 series<br>(415) 472-2500               | 8 to 384           | \$213 to \$316                        | United Technologies/UTX<br>1001 series<br>(818) 706-1000    | 40 to 2,800        | \$725 to \$875                          |
| 1200 series                                                                   | 8 to 800           | \$209 to \$377                        | UTX 1200/5000                                               | 300 to 4,000       | \$725 to \$875<br><b>Circle 426</b>     |
| Harris 20-20                                                                  | 8 to 1,920         | \$450 to \$500<br><b>Circle 409</b>   | Ztel/PNX<br>(617) 657-8730                                  | 150 to 650         | \$800 to \$1,000<br><b>Circle 427</b>   |
| Hitachi America/DX<br>(404) 446-8820                                          | 100 to 1,528       | \$600 to \$1,000<br><b>Circle 410</b> |                                                             |                    |                                         |
| Honeywell/Delta-plex<br>Series 2000<br>(612) 870-5200                         | 200 to 12,000      | \$700 to \$1,300<br><b>Circle 411</b> |                                                             |                    |                                         |
| Intecom/IBX<br>(214) 727-9141                                                 | 700 to 20,000      | \$800 to \$1,200<br><b>Circle 412</b> |                                                             |                    |                                         |

<sup>1</sup> The actual number of lines in a typical configuration may be more or less than the amount shown.

<sup>2</sup> Per-line prices for typical configurations; prices may vary according to network size. Prices for voice/data lines are, in most cases, for equipped-station lines.



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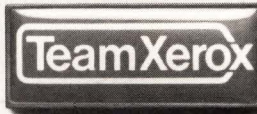
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c.p.s., the D-80IF is the fastest daisywheel printer ever made by Xerox. It has a built-in double bin sheet feeder. As well as the capacity to handle up to 16 computers at once.

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## DATABASE SYSTEM

NPL/R, a relational database applications system for microcomputers that uses NPL fourth-generation language, lets users select data from as many as 10 files to form records. Price: \$595. Records can have 4,000 characters, using 255 fields of data and 40 indices. NPL/R runs on the IBM PC with 256 Kbytes of memory and two diskettes, and the Victor 9000.

**Desktop Software Corp.**, 244 Wall St., Princeton, NJ 08540.  
(609) 924-7111. **Circle 207**

## FILE-TRANSFER PACKAGE

Ptel, a binary file-transfer program, allows IBM PC users to transfer binary and ASCII files to other users in a network. Price: \$195. Ptel also lets users upload and download files from electronic bulletin boards and move files between different operating systems and machines.

**Phoenix Computer Products Corp.**, 1420 Providence Hwy., Norwood, MA 02062.  
(617) 762-5030. **Circle 208**

## CONCURRENT PROGRAM

Concur, a program for the IBM PC XT and PC AT, allows concurrent processing of up to 10 applications. Price: \$195. Two RS-232C-compatible terminals may be connected to the IBM PC for a three-station multi-user operation. Price: \$395.

**Vaxon Inc.**, 6363 Wilshire Blvd., Los Angeles, CA 90048.  
(213) 655-6914. **Circle 209**

## SPEECH-INPUT SYSTEM

The Pronounce speech-input system for the IBM PC, PC XT, and PC AT lets users give instructions to their

computers and enter data by speaking into a microphone. Vocabulary files may contain 128 words or short phrases, and each word or phrase can be associated with up to 255 keystrokes. The system costs \$895 and includes an IBM PC board, software with predefined vocabularies for Wordstar and Lotus 1-2-3, a microphone, and a user manual.

**Microphonics Technology Corp.**, 234 S.W. 43rd St., Renton, WA 98057.  
(206) 251-9009. **Circle 210**

## EXPERT-SYSTEM SOFTWARE

Management Advantage expert-system software runs on the IBM PC. Price: \$249. The package offers assistance for over 70 management tasks, including motivating staff, delegating responsibility, and increasing productivity.

**Thoughtware Inc.**, 2699 S. Bayshore Dr., Coconut Grove, FL 33133.  
(305) 854-2318. **Circle 211**

## COMMUNICATIONS SOFTWARE

The Microsoft Access program lets IBM PC users access online databases, information-retrieval services, and electronic-mail systems. Price: \$250. The program has a menu system and a built-in language and can hook up to multiple sources.

**Microsoft Corp.**, 10700 Northup Way, Bellevue, WA 98009.  
(206) 828-7400. **Circle 212**

## SOFTWARE PLUS MODEMS

The Popcom C150 and Popcom X150 modems are bundled with the PFS: Access software package. The C150 costs \$469, and the X150 is \$499. Popcom modems automatically handle voice and data switching when transmitting from micro to micro. PFS:

Access software gives the modems the ability to remember and automatically carry out dialup and sign-on functions. The modems are Bell 212A- and Hayes-compatible.

**Prentice Corp.**, 266 Caspian Dr., Sunnyvale, CA 94088-3544.  
(408) 734-9810. **Circle 213**

## PROJECT MANAGER

Pentonproject project-management software runs on the IBM PC with 256 Kbytes of memory. It features scheduling, time analysis, resource analysis, and progress reporting. Data can be exchanged with Lotus 1-2-3, Symphony, and dBase II and III. Price: \$1,595. Pentonproject includes a user manual and walk-through tutorials.

**Penton Software Inc.**, 420 Lexington Ave., New York, NY 10017.  
(212) 878-9600. **Circle 214**

## ADD-IN DRIVE

The Innerspace 5¼-inch disk drive is an upgrade of the 10-Mbyte hard disk that is standard with the IBM PC XT. Price: \$2,195 for the ID40-XT, a 43-Mbyte drive; \$2,595 for the ID60-XT, a 60-Mbyte drive. Innerspace comes with installation software, instruction manual, and reference guide.

**Priam Corp.**, 20 W. Montague Expwy., San Jose, CA 95134.  
(408) 946-4600. **Circle 215**

## EASY DATABASE

The DBS/Experience database package runs on the IBM PC. Price: \$345. A ditto key copies information from one record to another and an update function changes all or selected records. Indexes are automatically updated.

**Postley Software Inc.**, 6855 Hayvenhurst Ave., Van Nuys, CA 91406.  
(818) 781-2912. **Circle 216**



## COMPATIBLE MICRO

The ITT Xtra XP is compatible with the IBM PC XT. The ITT Xtra XP uses an Intel 80286 processor and includes a minimum of 512 Kbytes of memory. It's available in two models: Model V comes with one floppy drive and one 20-Mbyte hard disk for \$4,595; Model III costs \$3,995 and includes one floppy drive and one 10-Mbyte hard-disk drive.

**ITT Information Systems**, 2350 Qume Dr., San Jose, CA 95131.  
(408) 942-4000. **Circle 217**

## MASS-STORAGE SERVER

The Sunmac Mass Storage Server transfers Lotus 1-2-3 and Symphony files on the IBM PC to Lotus' Jazz on the Macintosh. Sunmac can simultaneously connect the IBM PC network,

the Appletalk Personal Network, and others. The Sunmac Mass Storage Server with 10 Mbytes of storage without backup tape costs \$2,195. For 92 Mbytes of storage with tape backup, the price is \$8,245.

**Sunol Systems**, 1187 Quarry Lane, Pleasanton, CA 94566.  
(415) 484-3322. **Circle 218**

## SOFTWARE LINK

Respond/TTY software links an IBM PC, PC XT, PC AT, Portable, or compatible to mainframes, minicomputers, and microcomputers by emulating a TTY terminal. Price: \$125. The software is menu driven and can also access Dow Jones News/Retrieval, Compuserve, The Source, Dialog, and MCI Mail. Users can run other programs simultaneously while running Respond/TTY. The package includes a diskette with the program,

preset TTY terminal profile, profiles for seven major information services, and a manual.

**Software Synergy Inc.**, 466 Main St., New Rochelle, NY 10801.  
(914) 633-0400. **Circle 219**

## LOW-COST PC SYSTEM

One or two ME2 and ME5 executive workstations can be added to an IBM PC to form a multi-user, multiprocessor system that allows shared data access and communications between users. Prices are \$1,750 for the 256-Kbyte ME2 and \$2,150 for the 512-Kbyte ME5. Both workstations run Lotus 1-2-3, Wordstar, and dBase III and include an IBM PC-compatible keyboard.

**Microsystems International Corp.**, 100 Pennsylvania Ave., Framingham, MA 01701.  
(617) 875-9700. **Circle 220**

## RESEARCH REPORT

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## ENGINEERING SYSTEMS

The Cybernet Express Engineering Application Systems for the IBM PC XT cost between \$3,000 and \$20,000. The systems have been developed for a wide range of engineering disciplines. The family includes Power Systems for electrical engineering; Structures System for civil, aerospace, and mechanical engineers; Electronic Designer System for schematic capture and net-list extraction to logic simulation and verification; Piping Workstation for industrial facilities; and Resim Access for reservoir simulation applications. Features include a scratchpad for notetaking, a calendar, a file cabinet, and a calculator.

**Control Data**, 8100 34th Ave. South, Minneapolis, MN 55440.  
(612) 853-4013.

Circle 201

## INDUSTRIAL COMPUTER

The IBM System 9003 industrial computer is designed to handle manufacturing and process-control tasks. The basic model is priced at \$21,130. It can operate on a plant floor as a stand-alone computer or as part of an IBM host computer network via optional Systems Network Architecture fea-

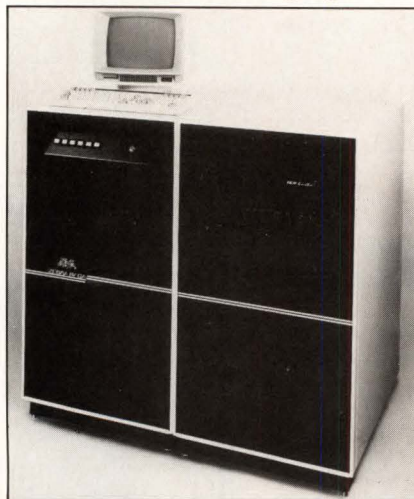
tures. The 9003 can be used for distributed numerical control of machine tools, control of robotic devices and manufacturing operations, and for temperature and pressure sensing. The system can be equipped with up to 5 Mbytes of memory and up to 40 Mbytes of online disk storage.

**IBM** (contact local sales office).

Circle 202

## BUSINESS COMPUTER

The Zebra 6700 has a 16/32-bit Motorola MC68000 microprocessor and accommodates up to 64 users. It's based on the Pick operating system and Access, an information-management and retrieval language. The



basic configuration costs \$86,500.

**General Automation**, 1045 South East St., Anaheim, CA 92803.

(714) 778-4800.

Circle 203

## NEW MAINFRAMES

The AS/XL Series general-purpose mainframe computers feature 2,000- and 5,000-gate-emitter-coupled logic with switching speeds up to 200 trillionths of a second. The two models in the AS/XL Series range in price from \$4.8 million to \$8.9 million. Both will be available in the second quarter of next year. Memory capacity for the

AS/XL Series will be up to 256 Mbytes of main storage, with up to 512 Kbytes of cache-buffer memory. Two new models of the 7380 disk storage subsystems have costs of \$104,880 for the BE model and \$128,000 for the AE model. They provide twice the storage capacity as the single-capacity 7380. A cache controller for the 7380 is available in four versions: 8 Mbytes, 32 Mbytes, 48 Mbytes, and 64 Mbytes.

**National Advanced Systems**, 800 East Middlefield Rd., Mountain View, CA 94040.

(415) 962-6000.

Circle 204

## MULTI-USER DESK-TOP

The Desktop Generation Model 45 is a multi-user system that runs Desktop/UX, an operating system based on AT&T's Unix System V. The dual-processor system supports up to eight users. The basic setup costs \$11,845 and includes 512 Kbytes of memory.

**Data General Corp.**, 4400 Computer Dr., Westboro, MA 01580.

(617) 366-8911.

Circle 205

## SUPER-MINI

The NCR 9400 is a 32-bit super-minicomputer with a processing-cycle speed of 150 nanoseconds. A basic system costs \$67,000 and includes a 1-Mbyte 9400 processor, a 40-Mbyte Winchester-disk drive, three crts, a 125-lpm printer, and the operating system.

**NCR Corp.**, 1700 S. Patterson Blvd., Dayton, OH 45479.

(513) 445-2380.

Circle 206

**Productivity tool for Burroughs systems:** Jacksonville Software Services Inc. (St. Augustine, FL) has released an enhanced version of its data-entry and file-maintenance system, RDE/RFM, for users of Burroughs large systems. The package is priced at \$11,500.

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CIRCLE 34



# YOUR CAREER

by Mary Miles, New England Editor



Illustration by Dan Culhane

## FEELING LIKE A FRAUD

**I**'m in a vicious cycle," says the dp director for a large machine-tool manufacturer. "I try very hard to match the expectations my superiors have of me, but when the rewards come—the raises, the promotions, the compliments—I don't get much real pleasure or satisfaction. I'm constantly worrying about the next set of expectations I'll have to fulfill. Now there's talk of promoting me to a general management position in a year or so. If I'm a chronic anxiety case now, what'll I be like when I have to cope with nontechnical matters? Success? I'm a mess!"

The information-center manager for a large sportswear manufacturer may change careers to escape feelings of inadequacy. "So far, I've been doing a pretty good job, but I'm afraid if I goof up, I'll have failed myself and a lot of other people. I feel as if I'm fooling my bosses. I'm thinking of going back to school. The pressure is just too much."

These managers suffer from the impostor phenomenon; they secretly sus-

pect that despite their successes and achievements, they are frauds. They may be up-and-comers with real accomplishments, but these managers share a deep anxiety that simultaneously drives them toward ever-greater challenges and more pervasive self-doubt. They agonize over the legitimacy of their successes; the more they achieve, the more convinced they are that disaster is just around the corner. They believe their successes have not come through intelligence and ability, but through luck, hard work, social skills, the right connections, or even clerical errors.

Researchers believe that at least 70 percent of those who achieve success suffer from the impostor phenomenon at least part of the time. In *The Impostor Phenomenon: Overcoming the Fear That Haunts Your Success* (Peachtree Publishers Ltd., \$15), Pauline Rose Clance, who along with Suzanne Imes developed the first in-depth studies of the impostor phenomenon seven years ago, notes the characteristics of a victim

of the impostor phenomenon. Chief among the characteristics are a preoccupation with perfectionism, a tendency to overwork, a need to be regarded as special despite a reluctance to accept such recognition, an inability to accept or believe praise, and fear and guilt about success.

In *If I'm So Successful, Why Do I Feel like a Fake?* (St. Martin's Press, \$15), Joan Harvey suggests that feeling like an impostor isn't the same as feeling insecure. Harvey says a typical victim of the impostor phenomenon has the drive and ability to achieve, but achievements, when they come, don't produce satisfaction. Success is tempered by a haunting fear that doom is at hand.

Harvey says although casualties of the impostor phenomenon often appear outwardly self-confident, they usually feel as though they've achieved success not because of their abilities and intelligence, but because they've been able to fool their bosses.

Pressure is a key contributor to feel-



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\*Regional

ings of inadequacy, making information management something of a hotbed for the impostor phenomenon. Few professions demand the efforts information managers must put forth to keep abreast of new developments. "There are enormous pressures to keep up," says the manager of office systems technology for a New York-based manufacturer of fragrances and cosmetics. The manager occasionally falls prey to the impostor phenomenon, but takes conscious measures to combat it. He remembers the feelings of dread that hit him when he was offered his position with the corporation. "When you're asked to take charge of microcomputing for an entire organization, it's natural to have anxiety about knowing enough to do the job well," he says. "It's a high-visibility position, and when it was first offered to me I had definite feelings of inadequacy."

The impostor phenomenon doesn't let you admit you're as good as you are, the manager says. "I used to tell myself that my promotion was a result of being in the right place at the right time." The failure to acknowledge one's own worth and ability can be very destructive. Such feelings can cause managers to refuse important projects or promotions, or spend too much time and energy doing everything perfectly, he says. "I try to carry a positive attitude," the manager says, "but in this field it's difficult."

The effects of the impostor phenomenon can be serious and far-reaching. Joan Harvey says the psychological pain caused by the phenomenon often leads to such physical maladies as shakiness, sleeplessness, decreased appetite or compulsive eating, tension headaches, abuse of alcohol or drugs, and obsessive or compulsive behavior. Managers unable to keep impossible self-

expectations and debilitating self-doubts in check can easily lose their effectiveness. As feelings of inadequacy become firmly entrenched, spontaneity and creativity decline; both the managers and their organizations suffer.

The cycle created by the impostor phenomenon can be vicious, but it can also be broken. The first step that must be taken to beat the problem is to see it for what it is: a harmful and unnecessary self-perception. Recognizing that feelings of inadequacy are symptoms of the impostor phenomenon rather than reflections of objective reality can go a long way toward quelling self-doubts.

Once they have unmasked their problem, casualties of the impostor phenomenon can work on eliminating it. One way to attack the problem is to keep a written or electronic record of it. By recording the occasions and circumstances that touch off feelings of inadequacy, victims of the impostor phenomenon may be able to better understand what causes their anxiety. Opening up to confidants about self-doubts can also help. One reason the impostor phenomenon is so hard to fight is that victims keep their feelings to themselves. Confiding in trusted friends explodes the secrecy that hides the problem. Victims can also help themselves by consciously pursuing positive feelings. Rather than downplay their accomplishments and the praise they bring, they should take time to bask in the glory of a job well done. In the same vein, sufferers who find themselves dwelling on past or potential failures should focus instead on past successes and fantasize successful resolutions of current challenges.

Few managers can escape occasionally feeling overwhelmed by their responsibilities; anxiety is part of the price of success. But when feelings of inadequacy become common, it's time to act. Left unchecked, the impostor phenomenon can seriously affect managers' performances and their careers. □

**The effects of the impostor phenomenon can be serious and far-reaching.**

*Has the impostor phenomenon affected you? How did you cope with it? Send me a letter describing your experiences to Computer Decisions, IP Editor, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Your comments will be held in the strictest confidence.*





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